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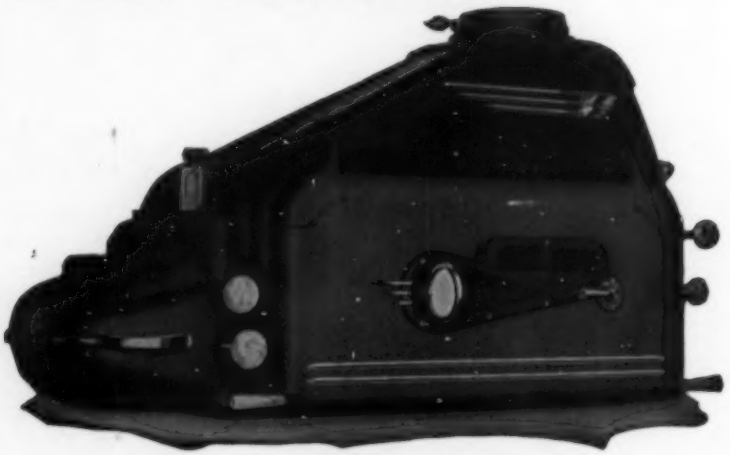

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INTERNATIONAL PROJECTIONIST

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Monthly Chat

RESULTS of the finest projection effort we have ever seen, considering all the diverse elements which went into its doing, was put on view at the New York Paramount Theatre for the premier and subsequent showings of "Strategic Air Command." Similar fine results will undoubtedly be obtained in other key cities utilizing the same presentation technique, a massive screen image (62 feet wide, 32 feet high); double-frame film projected by horizontal-pull projectors, and great gobs of screen illumination even though the condenser-type lamps pull only 160 amperes.

For image resolution, depth of focus and a terrificly flat field over the entire expanse of this giant screen, we have never seen anything like it.

But even the obvious worth of the Vista-Vision double-frame film process does not alter our view that such a giant screen image is just too big for even the largest indoor theatre (New York's Radio City Music Hall excepted) unless it becomes standard practice to close off the orchestra entirely and confine viewing to the balcony at a distance of at least 60 feet. Even then, side seats in the balcony would be less than wholly acceptable.

Also, we dislike the curved screen (while only 3½ feet deep) and the aperture curved top and bottom, ala CinemaScope. We found it simply impossible, except in the far reaches of the balcony, to encompass this giant screen image (orchestra viewing being a complete bust) without employing a constant head-swiveling motion, both up and down, that speedily tired and constantly irritated the several people in our party. Also, the sound level was much too high, but this was no fault of the projection people but rather another salaam to the high priests of the "bigger and louder" cult.

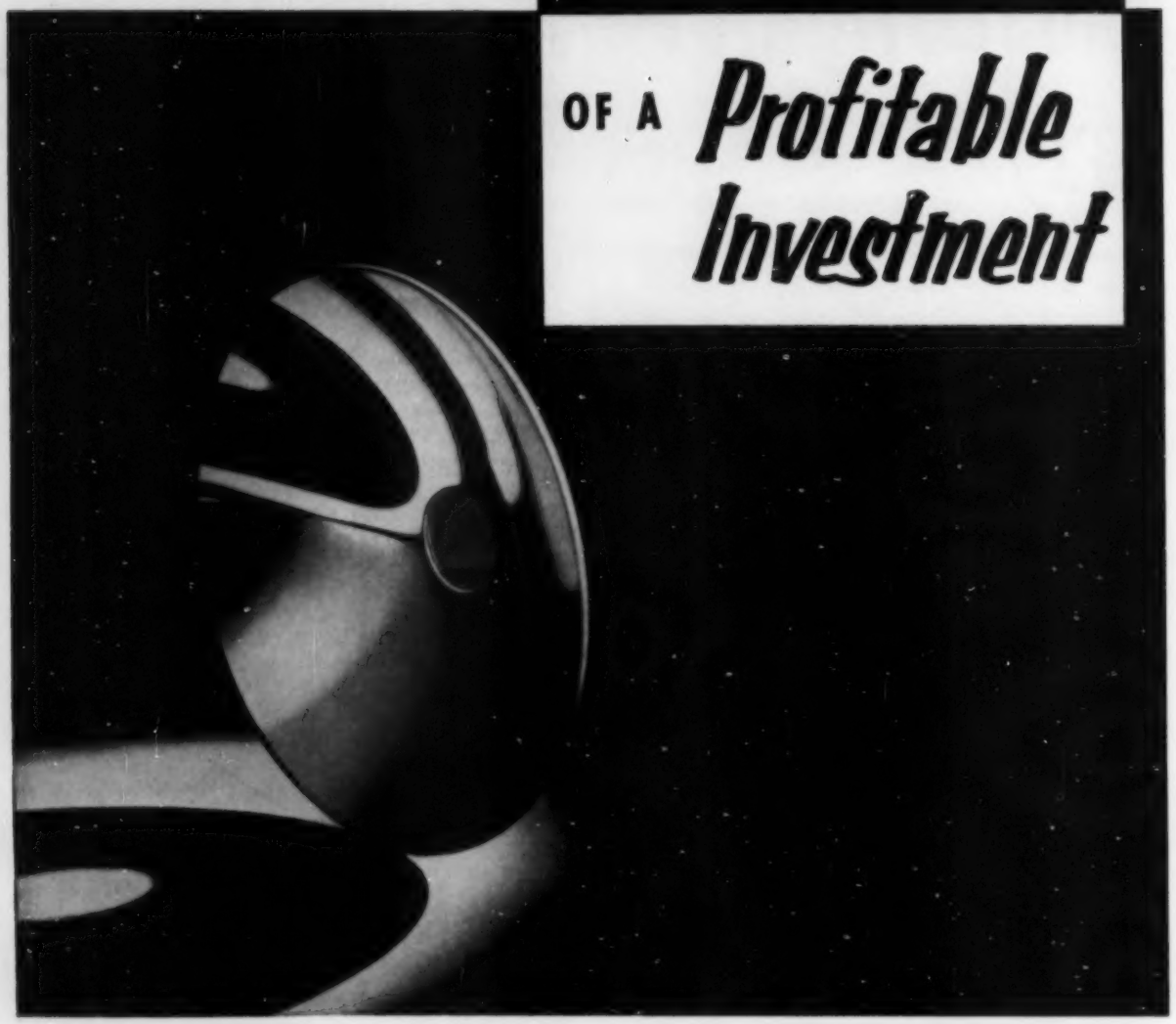
Of course, the pictorial content of "Strategic . . ." in *certain sequences* screamed for the "big" treatment; but in the indoor shots, especially those intimate boy-girl views, the effect was well-nigh ludicrous—as exemplified by a close-up of June Allyson in which her head is probably 20 feet high. After all, there *is* a limit to horizontal viewing tolerance.

Now, these giant screen images are great stuff for drive-ins which provide vastly improved sight lines (one wonders how they are ever going to up reflected screen light above the 4 foot-lambert mark, much less obtain an acceptable "field") but we may be thankful that the present mania on the part of producer-distributors is confined, in the indoor theatre group, to a very few large theatres.

Finally, we are convinced that projection problems—image size and equipment—be left to projection people and not dictated by producer-distributor personnel—even if they are studio or laboratory technicians.

EQUIPMENT manufacturers and dealers report that examination of exhibitors' books, freely offered for inspection, reveal that the murderous rental terms ranging from 50 to 90% of a theatre's *gross income* after operating expenses, which the distributor dictates, makes it impossible to expend any money on equipment which is desperately needed. Paramount Pictures' net profit in 1953, after taxes, was $6,779,563.

A PICTURE OF A *Profitable Investment*



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INTERNATIONAL PROJECTIONIST

VOLUME XXX MAY 1955 NUMBER 5

'Matching' Apertures and Lenses

By ROBERT A. MITCHELL

The selection and "matching" of apertures and lenses poses a difficult problem for the projectionist — the only technologically-minded person in or about the premises — not only in terms of technical but also economic considerations. Here in word and illustration is a means for simplifying this arduous task.

CONFUSION reigns! Whatever degree of standardization formerly existed with regard to picture format and aspect ratio has now vanished. Aperture plates by the dozen in differing aspect ratios are now available. And there are two commercial anamorphic processes in addition to conventional and non-anamorphic wide-screen projection.

Aspect ratios seldom bothered projectionists in bygone years. Even the introduction of sound-on-film in 1929 necessitated only slight changes in the *size* and *shape* of the screen. No one in those days was so rash as to slice any appreciable area from the height or width of a theatre screen.

The format of 35mm motion pictures was standardized in the earliest days of silent films in the serviceable 3:4 proportion—an aspect ratio of 1.333/1. Whatever the size of the screen, its width was always 1.333 times its height. The very thought of *widening* the screen was rank heresy!

First Aperture-Size Change

Old-timers recall the standard silent-film aperture—and also the nuisance of changing apertures when silent and sound-on-film subjects played on the same program. The projector aperture was originally 15/16-inch wide and 11/16-inch high. But even before sound came in, a slightly smaller silent aperture measuring 0.906" x 0.6795" was used by most projector manufacturers.

Notably, the standard silent aperture has a height-width proportion of exactly 3:4—an aspect ratio of 1.333/1. A picture of this ratio is projected on the screen when projection is horizontal—no "tilt" or projection angle.

The soundtrack occupies a strip about 1/10 inch wide. Now, when a strip of this width (more exactly, 0.106") was masked off, the sound track side of the silent aperture, the remaining opening (0.800" x 0.6795") was too nearly square in shape to be pleasing. The square-shaped picture was unavoidable when sliding-mask combination silent-and-sound apertures were used.

Dissatisfaction with the nearly square picture induced the restoration of the 3/4-proportioned aperture by "cropping" the height of the square-shaped sound film aperture. Thus came into being the 0.800" x 0.600" aperture, called the *proportional aperture*—proportional, that is, to the standard silent aperture and having an aspect ratio of 1.333/1.

Projection Angle Factor

But the proportional sound film aperture was not entirely satisfactory. It resulted in a projected picture having an aspect ratio of less than 1.333/1 when a substantial projection angle prevailed. The *average* theatre has a projection angle of about 12 degrees, which slightly elongates the picture.

To obtain an aspect ratio of 1.333/1 *on the screen*, therefore, a slightly wider aperture was proposed and adopted as standard in 1932. Although this aperture (0.825" x 0.600") has an aspect ratio of 1.375/1, it gives a picture having approximately the desired ratio of 1.333/1 when the projection angle is about average.

Until CinemaScope and wide screen appeared, the 0.825 x 0.600-inch aperture was the *one and only standard!* The shape of the screen, accordingly, presented no problems from 1932 to 1953, for both sound-on-disc prints and "straight silent" films had long since disappeared from the theatre field. Only the comparatively minor controversy of square vs. rounded

WIDESCREEN-ANAMORPHIC LENS- AND APERTURE-MATCHING TABLE

WIDTH / HEIGHT

	LENS E.F. → / APERTURE ↓	2"	2¼"	2½"	2¾"	3"	3¼"	3½"	3¾"	4"	4¼"	4½"	4¾"	5"	5¼"	5½"	5¾"	6"	6¼"	6½"	6¾"	7"	7½"	8"
NON-ANAMORPHIC	.825"X.600" (Ratio: 1.375/1)	.4125 .3000	.3667 .2667	.3300 .2400	.3000 .2182	.2750 .2000	.2538 .1846	.2357 .1714	.2200 .1600	.2063 .1500	.1941 .1412	.1833 .1333	.1737 .1263	.1650 .1200	.1571 .1143	.1500 .1091	.1435 .1043	.1375 .1000	.1320 .0960	.1269 .0923	.1222 .0888	.1179 .0857	.1100 .0800	.1031 .0750
	.825"X.497" (Ratio: 1.66/1)	.4125 .2485	.3667 .2209	.3300 .1989	.3000 .1807	.2750 .1657	.2538 .1529	.2357 .1420	.2200 .1325	.2063 .1243	.1941 .1169	.1833 .1105	.1737 .1046	.1650 .0994	.1571 .0947	.1500 .0904	.1435 .0864	.1375 .0828	.1320 .0795	.1269 .0765	.1222 .0736	.1179 .0710	.1100 .0663	.1031 .0621
	.825"X.471" (Ratio: 1.75/1)	.4125 .2355	.3667 .2093	.3300 .1884	.3000 .1713	.2750 .1570	.2538 .1449	.2357 .1346	.2200 .1256	.2063 .1178	.1941 .1085	.1833 .1047	.1737 .0992	.1650 .0942	.1571 .0897	.1500 .0856	.1435 .0819	.1375 .0785	.1320 .0754	.1269 .0725	.1222 .0698	.1179 .0673	.1100 .0628	.1031 .0589
	.828"X.446" (Ratio: 1.86/1)	.4125 .2230	.3667 .1982	.3300 .1784	.3000 .1622	.2750 .1487	.2538 .1372	.2357 .1274	.2200 .1189	.2063 .1115	.1941 .1049	.1833 .0991	.1737 .0939	.1650 .0892	.1571 .0850	.1500 .0811	.1435 .0776	.1375 .0743	.1320 .0714	.1269 .0686	.1222 .0661	.1179 .0637	.1100 .0595	.1031 .0558
	.825"X.412" (Ratio: 2/1)	.4125 .2160	.3667 .1831	.3300 .1648	.3000 .1498	.2750 .1373	.2538 .1268	.2357 .1177	.2200 .1099	.2063 .1030	.1941 .0969	.1833 .0916	.1737 .0867	.1650 .0824	.1571 .0785	.1500 .0749	.1435 .0717	.1375 .0687	.1320 .0659	.1269 .0634	.1222 .0610	.1179 .0589	.1100 .0549	.1031 .0515
ANAMORPHIC	C'SCOPE MAGNETIC .910"X.715" (Ratio: 2.55/1)	.9100 .3575	.8089 .3178	.7280 .2860	.6618 .2600	.6067 .2383	.5600 .2200	.5200 .2043	.4853 .1907	.4550 .1788	.4283 .1682	.4044 .1589	.3832 .1505	.3640 .1430	.3467 .1362	.3309 .1300	.3165 .1243	.3033 .1192	.2912 .1144	.2800 .1100	.2696 .1059	.2600 .1021	.2427 .0953	.2275 .0894
	C'SCOPE MAG.&OPT. .715"X.716" (Ratio: 2/1)	.7150 .3575	.6356 .3178	.5720 .2860	.5200 .2600	.4767 .2383	.4400 .2200	.4086 .2043	.3813 .1907	.3575 .1788	.3365 .1682	.3178 .1589	.3011 .1505	.2860 .1430	.2724 .1362	.2600 .1300	.2487 .1243	.2383 .1192	.2288 .1144	.2200 .1100	.2119 .1059	.2043 .1021	.1907 .0953	.1788 .0894
	C'SCOPE OPTICAL .839"X.715" (Ratio: 2.35/1)	.8390 .3575	.7458 .3178	.6712 .2860	.6102 .2600	.5593 .2383	.5163 .2200	.4794 .2043	.4475 .1907	.4195 .1788	.3948 .1682	.3729 .1589	.3533 .1505	.3356 .1430	.3196 .1362	.3059 .1300	.2918 .1243	.2797 .1192	.2685 .1144	.2582 .1100	.2486 .1059	.2397 .1021	.2237 .0953	.2098 .0894
	V'VISION ANAMORPH. .825"X.600" (Ratio: 2.06/1)	.6188 .3000	.5500 .2667	.4950 .2400	.4500 .2182	.4125 .2000	.3808 .1846	.3536 .1714	.3300 .1600	.3094 .1500	.2912 .1412	.2850 .1333	.2605 .1263	.2475 .1200	.2357 .1143	.2250 .1091	.2152 .1043	.2063 .1000	.1980 .0960	.1904 .0923	.1833 .0888	.1768 .0857	.1650 .0800	.1547 .0750

Numbers in body of table indicate relative sizes of projected pictures. (The upper figure in each box denotes width; the lower, height.) To find actual size of picture in feet, multiply each of these two numbers by the projection distance in feet. To match height of non-anamorphic (wide-screen) picture with height of anamorphic (CinemaScope) picture, find a relative-height number in non-anamorphic section of table which is closest in value to the relative-height number corresponding to CinemaScope aperture and lens used. See accompanying text for further details.

screen corners marked this peaceful era; and whether the corners of the picture were sharp or rounded, the aspect ratio remained the same.

But now the peaceful era of motion picture projection has vanished into the past. There is plenty of uncertainty as regards standardization, and there is no end of hustle and bustle as the projectionist switches lenses, anamorphic attachments, and aperture plates. And along with all this confusion comes the pressing problem of choosing the most suitable aperture and lenses for the different processes now in use.

'Matching' Procedure Problems

"How in the name of heaven," asks the worried projectionist, "can I best match wide-screen projection to CinemaScope? or to anamorphic VistaVision? Many patrons wouldn't notice too much difference between CinemaScope and wide-screen if it weren't for those blank areas at the sides of the screen during non-anamorphic, wide-screen projection."

The immediate problem, then, is one of aspect ratio and picture size. And the most obvious fact of all is that anamorphic (CinemaScope) and non-anamorphic (wide-screen) pictures cannot be *exactly* matched unless both pictures have *exactly* the same aspect ratio. If they do, the problem consists merely of selecting the right projection lens to use with each process.

CinemaScope has the greatest aspect ratios of all the different processes for regular theatre use. These aspect ratios are 2.55/1 for magnetic-track CinemaScope prints, and 2.35/1 for optical-track prints.

Both of these CinemaScope ratios are somewhat greater than we should care to recommend for non-anamorphic wide-screen projection. A wide-screen aperture, being smaller than a standard aperture, wastes light, and the greater its aspect ratio, the more light it blocks off. CinemaScope, on the other hand, passes maximum light to the screen because its aperture is much larger than a wide-screen aperture.

CinemaScope Image Advantages

CinemaScope pictures, then, look brighter than non-anamorphic wide-screen pictures. They are also less subject to vertical picture unsteadiness because less magnification is involved in the vertical dimension. But sidewise weaving of the picture is magnified by *both* CinemaScope and non-anamorphic wide-screen projection,

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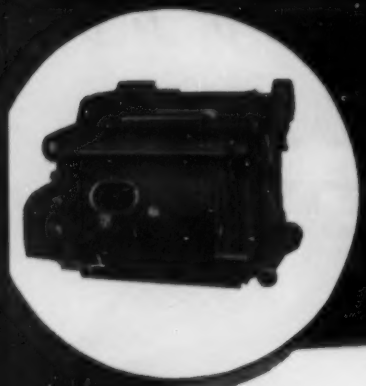

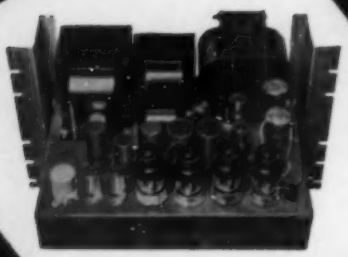

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and is of the same order whenever picture widths are the same.

The CinemaScope picture is also less subject to the focus-destroying effects of film flutter and buckling at the aperture than is wide-screen; but whether CinemaScope is actually *clearer* than ordinary wide-screen depends upon the quality of the print, the projection lens, and the anamorphic attachment.

Inherent Deficiencies Magnified

Despite recent improvements in the photography and printing of 35-mm films, no type of wide-screen picture, anamorphic or non-anamorphic, is as sharp, rock-steady and brilliant as the conventional 3/4-proportioned picture. Non-anamorphic wide-screen, in particular, suffers from inefficient illumination of the picture and from inherent defects of projection with short-focus lenses—magnified emulsion-grain, decreased contrast and clarity, film-flutter, and mis-registration and unavoidable dye-bleeding in color prints. Patron complaints of "poor focus" are nowadays very frequent; and, naturally, the projectionist is blamed.

All talk of alleged "progress" in motion picture technology to the contrary, the surprisingly high degree of brilliance and clarity of latter-day silent movies—those filmed from 1925 to 1929—has never been surpassed by *any* process, and only rarely equalled by conventional sound-on-film pictures. Projection of an original high-quality 35-mm silent print never fails to astonish people who somehow have acquired the notion that all "silents" were technologically crude. Even though there was less emphasis on strict "naturalness" in the old days, greater attention was applied to pictorial excellence and dramatic photographic effects.

Decide First on Preference

The welter of aperture plates and lenses that confronts us today is, all things considered, a necessary accommodation to a mass mind which is realistic rather than idealistic, anti-emotional rather than anti-intellectual. We have CinemaScope and wide-screen simply because the public wants them.

The easiest way to choose apertures and lenses for any theatre is, first, to decide what kind of effect is wanted (aspect ratios matched or not?) and second, to use the accompanying table, soon to be explained, to find out which apertures and lenses are needed to produce the desired results. This table contains no non-anamorphic wide-screen aspect ratio greater than 2/1 because we do not approve of greater ratios for wide-screen projection without anamorphic attachments.

Fortunately, 2/1 CinemaScope apertures are available for both magnetic- and optical-track prints. Those who insist upon matching wide-screen to CinemaScope should use this aperture (0.715" X 0.715") and, for ordinary wide-screen projection, the non-anamorphic 2/1 aperture (0.825" X 0.412). Two different lenses are needed, of course, and the table will enable you to select them without any guesswork.

Proscenium Opening Area

Most projectionists are rightly opposed to so great an aspect ratio for wide-screen, and many of us (including the writer) feel that the aspect ratio of CinemaScope should not be cut down unless the theatre stage is too small to hold the widest screen.

The pictorial effectiveness of CinemaScope depends entirely upon its panoramic sweep; its enormous expanse of screen. *Width* is what CinemaScope is for; but, on the other hand, it is absurd to use the full CinemaScope aspect ratio on a little 20-foot stage. In a small theatre the CinemaScope screen looks like a mere ribbon-like section of a regular 3/4-proportioned screen.

Width-Matching Indicated

The best that can be done in most instances is to match the CinemaScope and wide-screen *heights*. When this is done, the non-anamorphic wide-screen width is somewhat less than the CinemaScope width. In a few theatres of the narrow type, it may be advisable to match *widths*, resulting in a wide-screen height slightly greater than the CinemaScope height.

Now for our table. Picture width for non-anamorphic projection is calculated by the following formula:

$$\text{Width} = \frac{\text{Aperture Width X Throw}}{\text{E.F. of lens}}$$

while picture width for anamorphic projection is found by:

$$\text{Width} = \frac{\text{Aperture Width X Throw X Expansion}}{\text{E.F. of lens}}$$

The "expansion" in the last formula refers to the expansion-factor of the anamorphic attachment, being 2 for CinemaScope and 1.5 for anamorphic VistaVision.

Picture-height is found for *both* anamorphic and non-anamorphic pictures by a single formula, namely:

$$\text{Height} = \frac{\text{Aperture Height X Throw}}{\text{E.F. of lens}}$$

In each of these formulas all dimensions and distances should be in inches or fractions thereof. (Which means that the projection throw should be converted into *inches*.)

The numbers in the body of the accompanying table were calculated by means of these three formulas, *but with the factor of "throw" (projection distance) omitted*. The omission of "throw" results in values which may be converted into actual picture widths (top figure in each box) and picture heights (bottom figure in each box) by multiplying them by the "throw" which exists in your theatre. If you multiply by the "throw" *in feet*, picture dimensions will come out *in feet*.

For aperture- and lens-matching purposes, however, it is not necessary to do any multiplying. The table may be referred to directly, as we shall now explain.

1. TO MATCH WIDE-SCREEN HEIGHT WITH CINEMASCOPE HEIGHT.

What focal length of lens are you using for CinemaScope? Locate the vertical column headed by that lens E.F. Then, reading horizontally, find in that column the box opposite the CinemaScope aperture (or aspect ratio) which you use. In the box thus found are two figures: the upper one being the relative picture width, and the lower being the relative picture height. *Take note of the number denoting relative picture height.*

Now hunt through the non-anamor-

(Continued on page 33)

"The Big Track of Time"

Competition can be as stimulating in research as in manufacturing and merchandising. Electronics, in the race to achieve new triumphs, is run on the big track of Time, on which there is room for all who would compete. There is no finish line.

DAVID SARNOFF
Chairman of the Board, RCA

Bigger Drive-In Pictures Require Big-Scale Thinking

Deciding to enlarge the screen image at a drive-in is one thing; choosing the requisite equipment is much more complicated. Here are some tips thereon.

THE drive-in is a phenomenon in the motion picture exhibition field. Looked down upon for years as a sort of rowdy, backwoods substitute for the conventional Main Street movie theatre, drive-in theatres are now mushrooming and are attracting patrons despite the fierce competition from home Tv.

The drive-in construction boom has been of great benefit to the industry at large. In the past, however, putting on a drive-in show created difficulties for working projectionists called upon to solve many problems in presenting a picture on a big outdoor screen with equipment that was largely designed for the vastly different conditions of the indoor theatre.

Piling Size Upon Size

An additional problem arose during the last year when the "wide-screen" idea began to spread to drive-ins. The areas of already-large outdoor screens are now being increased to sizes that would have brought forth hoots of derision had they been suggested just a short time ago.

The appended information is selected from recent announcements by manufacturers of drive-in theatre equipment who are now marketing products designed to solve the formidable problems of outdoor projection on giant screens:

Enlarging Screen Towers

"Great care and considerable thought should be exercised before going ahead with a plan to enlarge a drive-in screen tower," asserts F. W. Keilhack, sales manager for the Drive-In Theatre Mfg. Co., of Kansas City. "The exhibitor must forget the race to have a larger picture than his competitor, or to be able to advertise the 'largest screen in the world'."

Almost daily there are calls from all over the country for wide towers or extensions—the wider the better. Consultation discloses that no thought has been given to sight lines, maximum comfortable viewing width at given points, width restrictions due to given lens sizes, or to the amperage needed in projection to maintain a sufficiently bright picture.

Plans for converting existing towers for a wide-screen ratio should be an "engineered" job—by competent consultants. The drive-in tower is not just another structure that any local mechanic can throw together with little or no thought. State building codes have become more stringent, and insurance companies are revising their requirements and rates. In most states, for instance, insurance rates on steel towers vary from one-half to one-fourth the rate on wood towers.

Foundation Strength Vital

Before enlarging an existing tower, it must be borne in mind that the foundation of that tower was calculated and designed for the weight of *that* tower and for given wind stresses. Any attempt to increase tower height unless the foundation is reworked should be discouraged. Also, projectionists should strongly urge that extensions to the screen tower rest entirely on their own foundation and frame. Methods that fall short of these recommendations are likely to result in costly damage during a bad storm.

To withstand the forces exerted upon towers by winds of various velocities, the tower and foundation must have a basic design with a minimum resistance of 30 pounds to the square foot, which will enable it to withstand winds up to 90 miles per hour. A safety factor of from 20% to 50% is usually added to this figure so that a tower is capable of withstanding winds of from 120 to 125 miles per hour.

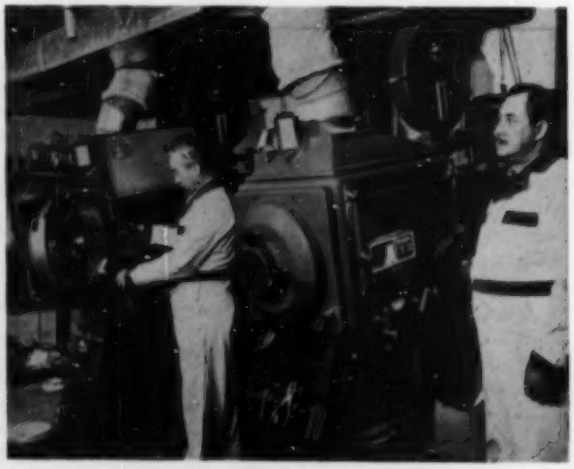
"The actual wind resistance of the tower," adds Keilhack, "results from a combination in design of the foundation and steel framing, plus planning so that the ultimate stress on the supports of a steel tower will be only one-third of their established breaking point.

"The controversial question of whether a drive-in screen should be curved or flat we leave to the exhibitor and his technical help, as our towers can be fabricated either way. We do feel, however, that a proper curve can improve the picture in certain installations by reflecting light to the opposite extreme sides."

Forward Tilt of Screen

A forward tilt of the entire screen surface is very important in conserving light—directing it at the cars instead of wasting it toward the sky. In most cases a tilt of more than 6 or 7 degrees is not desirable. A tilt of one foot forward for each 10 feet of height is about the average required.

When a screen tower is painted white, the color contrast and color balance is better than with reflective-type paint, according to well-informed opinion. However, there are several



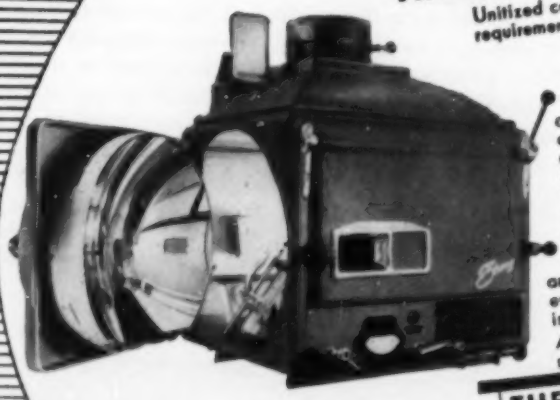
First installation of the improved Strong "135" arclamp with 18-inch reflectors (IP for April) was in the 41 Twin Drive-In at Milwaukee, Wis. Having a capacity of 2000 cars, the screen is 130 feet wide by 60 feet high. Shown here are Don Fretch and Harry Rotter, members of IA Local 164, Milwaukee.

The *Strong* 18" f/1.7 Reflector Super "135" for theatres with f/1.8, f/1.7 or f/1.5 objective systems and projectors cleared for these high speed optical systems.
Also available with 16-1/2" f/1.9 reflectors.

Shown is installation of Strong Super "135" lamps at the Miracle Mile Drive-In, Toledo, Ohio. Installation by Theatre Equipment Co., Toledo, Ohio.

MOST POWERFUL OF ALL PROJECTION LAMPS

PROVED BY IMPARTIAL FOOT-CANDLE-METER TESTS



Unitized component design. Quick, simple changes attain the correct light requirement for any of the new presentation techniques, even two or more on the same program. Burn a choice of four different carbon trims; 9, 10, or 11mm regular trim, and 10mm Hitex in a total of seven separate manners to attain any desired degree of cost of operation, screen illumination, or burning time. A single control selects any desired amperage. NEW, long life positive carbon contact. NEW ventilated reflector frame, insures cool operation of reflector and rear section of the lamp even at extreme angles of projection.

NEW Strong Infra Ban Beam Cooler blower fan. New removable filter holder.

Exclusive Lightronic crater-positioning system automatically maintains the correct arc gap length and correct position of the positive arc crater at the EXACT focal point of the reflector. A perfect light, evenly distributed, of constant intensity and unchanging color value, is maintained at the screen without manual adjustments.

A jet of air stabilizes the burning arc and prevents deposit of soot on reflector.

When the lamps are STRONG the picture is bright!

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

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FILM DAMAGE!

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NEW MOTIOGRAPH WATER-COOLED FILM GATE AND APERTURE COOLING BLOWER

*** Film does not buckle even when run for four consecutive 20-minute periods! * Gate temperature held at only 5° above room temperature (as opposed to a temperature of 190° for a non water-cooled gate). Immediate rethreading possible without burned fingers.**

These tests were run on Motiograph AAA projectors equipped with 52° shutter blades and high-intensity reflector type arc lamps burning rotating positive carbons at 135 amperes and WITH NO FILTER.

These water-cooled film gates and aperture cooling blowers are now available on new Motiograph AAA projectors, and are also obtainable for Motiograph AAA and AA projectors presently in use.

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schools of thought on this subject. "Where a drive-in screen is not surrounded by scaffolding or ornamentation at the top and sides," Kielhack concludes, "we urge that the use of black masking be discontinued and that the picture overshoot the screen tower to eliminate keystone, with the black of the night serving as masking."

Aluminum-Plated Screen Surface

The Motion Picture Research Council recently made an announcement of considerable interest to owners and projectionists at large drive-ins where a white-painted screen cannot return a high light level. The Council has developed an all-aluminum screen that controls the direction of reflected light so that it reflects in a flat fan-shaped pattern which just covers the area occupied by the drive-in ramps.

From the sky, the aluminum screen appears dark; but from the ramps it is 300% brighter to the eye than a screen painted white, according to the Research Council. [ED.'s NOTE: This we have to see.] Made from aluminum plating with a surface of small continuous vertical grooves, it is said to reflect light to an angle of 45 degrees from one side of the screen with little fall-off despite the directional reflective characteristics of the aluminum.

This aluminum screen is fabricated of panels 6 inches wide and 6 feet long by the Manco Plating Co. of Los Angeles, under license from the Research Council. The surface of the panels is treated with an electrolytic oxide coating which is said to produce a hard, weather-resistant finish. No painting or maintenance other than washing is required, it is said.

Bigger Lamps Necessary

Arclamp manufacturers have been well aware that the job of providing the equipment to light giant drive-in screens rests squarely with them. To fill these bigger screens with an acceptable picture new lamps are usually needed, such as the standard Peerless Hy-Candescent condenser-type lamp designed to burn as high as 180 amperes with 13.6-mm carbons, and new high-powered reflector lamps manufactured by the Strong Electric Corp. and C. S. Ashcraft Mfg. Co. A similar high-powered reflector lamp is also available from RCA.

The features of the new Strong and Ashcraft lamps have been reported on in detail in IP during the past few months. The new Ashcraft lamp was described in IP for March; and an article on the new Strong lamps with automatic arc-gap control, written by Arthur Hatch, appeared in IP for April. Both of these lamps feature 18-inch mirrors and internal blower systems to remove heat from the reflectors and other parts of the lamp. The Ashcraft lamp is also fitted with water-cooled carbon contacts.

However, since the great heat developed by these powerful lamps requires cooling measures within the lamp itself, it is easy to see that their light beams will have a pronounced effect on the fragile strip of film moving past the aperture.

Controlling Heat on Film

In the past few years filters of heat-absorbing glass have often been placed between the light beam and the aperture to eliminate a large proportion of the light's heat rays while passing most of the available light. But now lamps have become so powerful that the heat problem has again become critical. Also, in order to match the larger reflectors and transmit all the extra light produced to the screen, F/1.8, F/1.7 and even F/1.5 lenses are being used. The depth of focus of these lenses is much more critical than slower lenses, and buckle or flutter of the film due to heat becomes much more noticeable on the screen. It became necessary therefore, to incorporate in the projector head some means of cooling the film directly when these latest arclamps are used at full power.

Film cooling is being accomplished in the latest projector models by means of water-cooled film gates and air-blower systems trained directly on the film. Elsewhere in this issue of IP will be found an account of an air and water-cooling system now available for Motiograph projector heads. A water-cooled film gate has been a standard component of the Century projector head for some time.

Larger Film Image

A development that may in the future become most important to drive-in projection is the use of a larger film image such as the widely-acclaimed double-frame horizontal Vista-Vision print. A specially-designed Century projector handles these V-V prints. Projectors such as the horizontal type and others now being designed to accommodate film widths from 55- to 70-mm provide large drive-ins with a method of greatly improving the sharpness and clarity of their pictures in addition to raising their light levels.

Considering the many ramifications of drive-in operation, one thing is certain: when considering changes of any sort the best insurance for satisfactory performance is to consult those who specialize in such matters — either structurally or equipment-wise. It might not be a bad idea either, to solicit some sort of *warranty as to performance* under given conditions and over a given period of time. Past experience proves this wise.

Increased Attendance Seen

Weekly motion picture attendance that will average from 50 to 55 million and theatre gross revenue that may reach $1.3 billion are forecast for the year 1955 by the financial research firm, Standard and Poor's. The Wall St. Firm also expects that film production companies will moderately exceed their profits of last year, but points out that theatre profits will be limited by increases in film and other operating costs.

Theatre attendance during the early months of 1955 was estimated at about 50 million weekly. It was predicted that drive-in attendance figures, when the outdoor season gets into full swing, may raise the yearly average as high as 55 million. This compares with an average of 49 million in 1954 and 46 million in 1953.

The Wall St. firm sees around 19,000 theatres in operation or ready for operation in early 1955, including some 4,100 drive-ins, to be increased by mid-year to more than 4,500. The larger number of theatres, plus a prospective attendance gain and higher net admission prices are said to raise the possibility of a $1.3 billion gross, against $1.2 billion last year. It is pointed out that theatres this year will reflect full-year benefits from reduced Federal admission tax, which became effective April 1, 1954.

"Theatre operators, however, are handicapped by increases in film and other operating costs," Standard & Poor's cautions, "and any further improvement in 1955 earnings will be small at best. Profits of major producers may show moderate gains this year, aided by an expected rise in revenue from abroad, but gains are expected to be less than those registered in 1954.

Standard & Poor's sees some slackening in the demand for new theatre equipment this year, pointing out that most of the large theatres have been renovated. However, the report continues, "sales should nevertheless continue at a relatively high rate."

The CinemaScope Trailer

"Sandwiching" a short length of 'Scope film into a program is difficult in most projection rooms. Here is a workable procedure.

By Joseph F. Holt
Member, IA Local 428,
Stockton, Calif.

NATIONAL Screen Service recently notified theatres which exhibit CinemaScope attractions that all trailers are to be furnished in anamorphic picture version with magnetic sound unless the theatre is already listed as preferring the optical-sound version. Cited is the fact that screening a CinemaScope trailer in a wide-screen ratio other than the one in which it is released detracts from its appeal, and that the use of the CinemaScope picture and sound is desirable "even if it should be necessary to hold a short intermission" for changing lens and aperture.

Although many theatres have been using the normal-picture trailer on CinemaScope productions, there are some that have been using the anamorphic-magnetic type even though it might be the only such subject in the entire program. Here is a simple and effective means of screening a single trailer without a visible break in screen continuity.

Propectionists not blessed with a 3-or-4 projector room (the vast majority) have always been quick to seize upon any method which will overcome this handicap. The basic idea suggested here was used widely in screening Magnascope during the 1930's.

The "Sandwich" Routine

The strange thing about what we call "the sandwich routine" is that even those old-timers who used this simple method years ago have forgotten about procedure which will solve *any* problem of inserting a short segment in a program.

Consider a representative program and determine how the "sandwich" method is used. The program is one where we have two "normal" features, news and cartoon together with one "normal" prevue trailer and one CinemaScope-magnetic trailer. Suppose that the routine is as follows:

Feature 1
Prevue opening
CinemaScope trailer
Also on same program strip:
"Normal" trailer
News
Cartoon
Feature 2

Leader which is *blank* should be inserted between the prevue opening trailer and the "Also" strip. The purpose of the blank strip is to provide 40 or 50 feet of film for cooling and halting the projector which is to screen the "normal" film following the CinemaScope trailer.

The writer has found that 50 feet of blank film provides adequate time under almost any condition, but while the actual length of blank film is not critical, it is extremely important to follow the blank film with a readily identified strip such as white opaque. The white opaque indicates that the blank section is finished, and if followed by the starting footage used in the room, will make an accurate changeover from the short insert easy and reliable.

Accordingly, our reel makeup might look something like this:

Reel A: Final reel of Feature 1
Prevue opening
Blank film (50 feet)
White opaque tally
Start footage (8 or 9 feet)
Also on same Program strip:
"Normal" trailer
News
Reel B: Leader (2 to 3 feet shorter than prevue opening)
CinemaScope trailer
Blank tailpiece

When reel A is started, reel B is threaded in the idle projector. When the prevue opening trailer appears, if the leader on the CinemaScope trailer has been properly chosen, reel B is started and the trailer will be at the aperture when the prevue open strip is finished. At this time the changeover is accomplished and focus of the CinemaScope trailer is checked.

Reel A is now watched as it comes off the upper reel. When the opaque strip appears, the machine is halted so that the proper starting footage remains between the aperture and the strip which is to follow the CinemaScope trailer.

At the cue on the end of the CinemaScope trailer, reel A is started and continues to screen, while the projector which was used for reel B is made ready for the remainder of the program.

There is no need to detail some of the other situations which arise. The experienced projectionist can readily work out reel mountings which will provide the length of time he deems necessary to make complete changes in projection systems.

Optical-Magnetic Switching

Whatever the requirements of the program, be sure to mount together film which is projected with like methods of visual projection. It is not difficult in most projection rooms to obtain sound switching between optical and magnetic sound, but it may be that your CinemaScope-magnetic aperture will show the optical sound track if used on CinemaScope-optical prints.

If your pedestals are not readily movable in the lateral direction, management should be encouraged to provide base-shifters. Off-center titles are unnecessary and give the impression that *you* are careless.

Provide some means of reminding the projectionist that the particular reel he is now threading differs from the last one. Write on strips attached to the leader that the film on that particular reel is CinemaScope and magnetic sound. If that particular reel is the only one of its type in the program, it is extremely easy to neglect to thread through the magnetic soundhead. Applying these suggestions you will be on the way toward easy and trouble-free use of CinemaScope trailers of whatever length.

New Ace ClearVision Splicer

The Ace ClearVision non-magnetic film splicer suitable for splicing all types of 16- and 35-mm film is now in production and will be marketed shortly by Camera Equipment Co., 1600 Broadway, New York City. Developed by Irving Merkur, well-known projectionist-manufacturer, who is already credited with the Ace cuemarker and the Ace reel-end alarm, this new splicer is perfectly adapted for speedy, sure splicing of all film—with either a straight or diagonal cut—including the new DuPont polyester Cronar film described in IP for March, 1955, p. 7.

The ClearVision splicer was explained and demonstrated at the May meeting of the 25-30 Club of N. Y. City as this issue of IP was on the press.

Bulb Rectifier Anatomy, Operation

Some projectionists in our Local advocate leaving the A. C. power turned on in the rectifiers at all times. They assert that if the bulb be left on even while the arc is not operating, it helps to prevent the filament from sagging; while turning off the bulb causes the filament to be continuously heating and cooling, expanding and contracting. Which is preferred practice, and what effect does either procedure have upon bulb life?

ALFRED G. QUINN, Local 299, Winnipeg, Man., Canada

The appended communication provided an excellent opportunity for a detailed exposition of the basic principles, structure and operation of an important projection unit—the tube rectifier.—EDITOR.

IP's Viewpoint

AS far the life of Tungar-type rectifying bulbs is concerned, it makes no discernible difference whether the bulbs are turned off when not in actual use or left on during the entire show period. There are other factors to be considered, of course, such as wear and tear on switches, reactance kickback, and the possibility of accidental application of plate load when the filaments are not up to full operating temperature.

Some of these factors, such as minor mechanical wear and tear, require no discussion. Other factors which influence the useful life of these tubes warrant explanation.

Intermittency Not Harmful

True, the filaments of rectifying bulbs expand as they are heated, and contract when cooled; but it is also true that no appreciable amount of permanent filament sagging results from intermittent operation. Moreover, a slight sag of the filament, even when present, does not impair the functioning of these bulbs.

Because the filaments of Tungar-type rectifying bulbs are operated at a temperature somewhat below white heat, evaporation of metal from the heavy filaments is a negligible factor in spite of the fact that the gas pressure in these bulbs is rather low, seldom exceeding 10 mm of mercury. Of far greater importance, as regards the useful life of rectifying bulbs, is the special composition and molecular structure imparting maximum electron-emission characteristics to the filament.

The filament of a rectifying bulb, unlike that of an ordinary light bulb, contains thorium. The thorium increases the emissivity of the tungsten. The last stage of manufacture involves a process whereby the thoriated tungsten filament is raised to white heat to bring the thorium to the surface of the tungsten wire and produce an electronically-active form of the metal. The desirable electron-emitting properties of this specially prepared filament are definitely impaired by incorrect operating conditions.

Structure of Tungar Bulb

A Tungar-type rectifying bulb is a *diode*, or 2-element tube. One element is the *cathode*, or negatively-charged electron-emitter. In the Tungar-type bulb, the filament itself serves as the cathode. The other element is the *anode*, or positively-charged plate to which the electrons are attracted by the electromotive force supplied by the secondary winding of the transformer. The cathode is made of graphite, a substance which best withstands the heating effects of heavy electron bombardment.

High-voltage, low-current rectifying bulbs are *vacuum* tubes; but Tungar-type bulbs are *gas-filled* to make them low-voltage, heavy-current devices. The gas employed is usually argon, one of the chemically inert gases, and only a small amount is admitted to the bulb. It is the gas-ionizing action of the clouds of electrons given off by the hot filament which produces the blue-violet glow surrounding the filament. The presence of this glow indicates that the bulb is operative.

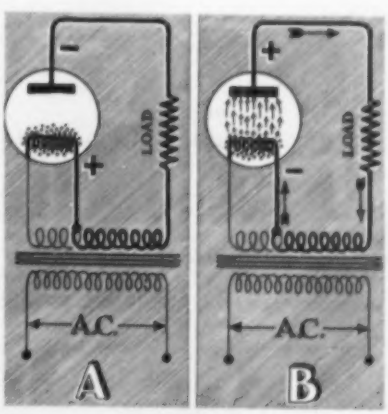

FIGURE 1

A. Electrons cannot pass from the heated filament (cathode) of a rectifier bulb when alternations of the current place a positive charge on the filament and a negative charge on the plate (anode). The electrons, being repelled by the plate, merely cluster about the filament as a space charge. B. But when the current reverses, the electrons stream across the gap to the plate which, being positively charged, attracts them.

Electrons emitted by the cathode (filament) continually bombarded atoms of argon gas, knocking out vast numbers of electrons from them. Now, an atom thus divested of some of its electrons becomes a positively-charged particle called an *ion*. Each ion wanders about until it finds electrons to capture, thus turning itself back into a neutral atom.

Operating Characteristics

When the bulb is actually operating, the electrons from gas atoms as well as many of the electrons emitted from the cathodes (filament) are drawn to the positively-charged anode, where they appear as plate current. Many of the positively-charged gas ions, drawn to the negatively-charged cathode, move in the other direction and regain new electrons from the cloud of electrons coming out of the filament. The main stream of electrons (electric current) accordingly moves from the hot, electron-emitting filament to the non-emitting plate (anode). The rectifying action of the bulb depends wholly on this uni-directional flow of electrons from cathode to anode.

If, however, the filament-circuit is disconnected while current is being taken from the plate, the loss of "space charge" (a name for the cloud of electrons sent out from the filament by heat) permits a sudden torrent of positive gas ions to rush upon the negatively-charged *unheated* filament and bombard its specially prepared surface. The action is so violent that a momentary surge of reverse current may flow from the anode to the cathode.

The result of this electronic "explosion" is partial destruction of the electron-emitting powers of the filament and impairment of the rectifying action of the bulb. While this damage may sometimes be corrected by applying excessive voltage to the filament for a short period of time, a rejuvenated bulb is seldom as good as a new one.

It should always be kept in mind, therefore, that the plate circuit must never be closed (that is, "load" must never be applied) unless the filament is heated to full operating temperature.

Under-Volting a Grave Mistake

These facts have an important bearing upon the practical operation of bulb rectifier units. Some projectionists, knowing that the life of an ordinary incandescent bulb may be prolonged enormously by under-volting it (that is,

(Continued on page 31)

Drama in a diner

. . cause-and-effect in an eye-span

TODAY wide-angle, big-screen entertainment compresses whole chains of events into the sight span of the human eye . . . offers, thereby, greater scope for producer and director—better entertainment for the audience. This has meant new problems, of course . . . new problems in production, processing and projection . . . problems which the Eastman Technical Service for Motion Picture Film is daily helping the industry to solve. Branches at strategic centers. Inquiries invited.

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In The SPOTLIGHT

Earl McClintock (right), business representative for Projectionists Local 262, Montreal, Canada, presents a gold life membership card to Lester B. Isaac, national director of exhibition for Cinerama. McClintock is chief projectionist at the Imperial Theatre in Montreal where "This is Cinerama" is now being shown.

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

PROMULGATION by Otis M. Whitney, commissioner of public safety for the Commonwealth of Massachusetts, which made official, as of April 21 last, an amendment to the rules and regulations "governing the use of cinematographic and similar appartus for the exhibition of motion pictures,":

"In the exhibition of motion pictures, no nitrate film shall be used. All film shall be acetate film, known as safety film. Every motion picture machine shall be equipped with a dowser handle and control switch operated from either side of the machine. While exhibiting motion pictures, the operator shall devote *his entire time and attention to that work.*

In any theatre where the equipment in the booth meets these requirements, and is approved by an inspector, only one operator will be required, otherwise two operators shall be in attendance during the exhibition of motion pictures."

Immediately upon receipt of this exchequer-gladdening news, the president of Independent Exhibitors of New England sounded off as follows:

"It has been a long up-hill battle by the exhibitors . . . to have this burdensome regulation requiring two men . . . lifted. A lion's share of the victory is credited to . . . former president Irving A. Issacs."

Now, this great "victory" was achieved by a group of employers banded together (just like the organized projectionist craft) to promote their own economic welfare. Combines by employers, however, are in the "public interest" — that is, of the "haves" — while any combine of the "have nots" in the form of a Labor Union is inimical to the public welfare—says they.

IP poses just two questions for Commissioner Whitney:

1. If a projectionist devoted "his entire time and attention" to the exhibition of motion pictures, what wraith will swoop down into the projection room and perform those chores which are a must *before*, *during*, and *after* the projection of such pictures?

2. Why the insistence upon a "dowser handle and control switch operated from *either* side of the machine" when it is manifestly impossible for the projectionist to be at other than *one* side if he is to observe both the wording and spirit of the regulation as promulgated?

When the Commissioner digests this frankfurter and lets IP have the benefit of his sagacity (not to mention a touch of magic), we have a couple of more pertinent inquiries bearing on this self-contradictory ruling.

● The 25-30 Club of New York City has asked IP to communicate to the projectionist craft at large its deep appreciation to The Strong Electric Corp., National Theatre Supply Co., and all those who contributed in any

THEATRE OWNERS IN WACO, TEXAS, PRESENTED WITH HONORARY LIFE MEMBERSHIPS IN IA PROJECTIONISTS' LOCAL 597.

Friendly labor-management relations were exemplified in the recent award to five motion picture theatre owners of honorary membership cards in Local 597, Waco, Texas. The presentations were made last month at a breakfast party held at the Elite Cafe in Waco. The honored guests—W. S. McLemore, owner of the Melrose Theatre; Carl Lemke, Crystal Theatre; Ed Newman, Oaklawn Drive-In, Westview, Orpheum, Rex, and Imperial Theatres; and E. C. Houck, owner of the Joy Drive-In Theatre—are shown above, second, third, fourth, and fifth from extreme left. The fifth exhibitor, Abe Levy, of the Rivoli and Strand Theatres, was unable to be present. Also shown are the following members of the Waco Local: H. F. Dunn, J. G. Daniels, A. M. Pudig, Hugh Yopp, C. J. Keeler, R. J. Machu, Ray J. Morrow, F. G. Knight, Bert Blanton, H. C. Yopp, Jerry Gage, W. C. Davis, C. L. Holt, E. O. Anderson, and J. F. Horne.

HARTFORD LOCAL 486 AWARDS GOLD LIFE MEMBERSHIP CARD TO CHARLES S. NORTH

Seen above are some of the guests at the recent surprise party Hartford Local 486 tendered in honor of its business representative Charles S. North. Left to right: Peter J. DeCarli, recording-secretary treasurer of the Local; William C. Scanlan, IA trustee; North; Gustav L. Soderberg, president of 486; IA President Richard F. Walsh, who made the presentation; D. I. MacDonnell, financial-corresponding secretary for Local 486; and Walter F. Diehl, IA representative.

degree to the first public lecture-demonstration of the improved Strong "135" arclamp at the April meeting of the Club. Particular thanks is due to Arthur J. Hatch, vice-president in charge of engineering, and Arthur Brown, field engineer, of The Strong Elec. Corp., no less than to Allan Smith, New York City manager for National Theatre Supply, for their efforts in making this meeting an outstanding success.

● *Out-of-Town Visitors to IP Offices:* H. N. (Doc) Elliott, Toronto Local 173, who dropped in to discuss audio-visual technical matters in general; George Raaflaub, secretary of Syracuse Local 376 and president of the N. Y. State Ass'n of Motion Picture Projectionists; and Neil Bishop, Chicago Local 110, whom we wished bon voyage as he and Mrs. Bishop sailed for Europe.

● The California District Court of Appeals recently upheld an arbitration award denying the claims by Southside Theatres, Inc., of Los Angeles, that IA Local 150 violated its contract by demanding the employment of two projectionists for the showing of 3-D pictures. About a year ago Judge Praeger of the Superior Court handed down a ruling vacating the arbitration award originally granted in favor of the union.

● The first nation-wide labor agreement covering employes in the closed-circuit Tv industry was recently concluded between the IATSE and TNT (Theatre Network Television, Inc.), with the signing of a one-year contract. This contract covers operations in all localities in the United States and Canada where TNT televises closed-circuit programs. TNT already has a 41-city network of large-screen projectors, mobile within each area, which will be operated by IA men.

The first telecast under the new contract took place on May 9, when a network of 35 cities carried a special program for doctors, sponsored jointly by the American Medical Association and the Smith, Kline and French Laboratories.

Commenting on the contract, IA President Walsh stated that "the agreement is an important milestone in the progress of an industry which has a tremendous potential in the fields of entertainment and communications. It signalizes the acceptance of the network concept of complete facilities and service as the best means of developing and maintaining the highest technical standards through the use of skilled IA personnel."

Nathan L. Halpern, president of TNT, expressed his satisfaction with the outcome of the negotiations and declared that "good labor relations have been basic to every successful business in the communications field. TNT is happy to have established a stable labor structure for the closed-circuit Tv industry."

International Representative John J. Francavilla, represented the IA in the negotiations.

● Rounding out 48 years in show business, Cecil C. Franklin, veteran member of Local 233, Buffalo, N. Y., retired on April 15 last from his job as projectionist at Shea's Buffalo Theatre. He plans to spend the next year traveling with Mrs. Franklin—a long-cherished dream.

Franklin worked at the Buffalo Theatre for the past 27 years—from

Cecil C. Franklin, retired member of Buffalo Local 233.

August 1928 to April 1955—and prior to that at Loew's State Theatre in Buffalo until it closed in 1928. He has been an IA man since 1910, and has

(Continued on page 30)

SEEN AT 25-30 CLUB LECTURE-DEMONSTRATION OF STRONG "135" PROJECTION LAMP

Left to right: Ben Stern, treasurer; Sidney Wein, sgt.-at-arms; Joe Perlman, trustee; Allan G. Smith, hon. member and manager of N. Y. branch of National Theatre Supply; Morris Rother, past president; Tony Boscarelli, vice-president (Local 384, Hudson County, N. J.); Morris Klopholz, recording secretary; Julius Wetzler, trustee; Arthur J. Hatch, vice-president, and Arthur Brown, field engineer, of The Strong Electric Corp., and Jack Winick, president of the Club.

Video-Film Camera

By AL SIMON

Production Supervisor, MacCadden Corp., Hollywood

New dual-purpose camera which will photograph simultaneously a show for "live" Tv and record it on film is described by a pioneer of filmed Tv shows. Probabilities, not possibilities, are enumerated herein as originally presented by our esteemed contemporary, AMERICAN CINEMATOGRAPHER.

Allied Arts And Sciences

There is a vast field of scientific endeavor which is directly contributory to motion picture production and, therefore, to the projection process. The projection craftsman should have a well-rounded understanding of these contributory factors.

THE WEDDING of electronics and film in a single dual-purpose video-film camera was inevitable. When shooting my first Tv show on film in May, 1951, I saw the advantages such a camera offered: the ability to televise a show "live" and at the same time record it on motion picture film for delayed broadcast; also, the arrangement would make possible a practical electronic view-finder, enabling the cameraman and others to see the scene *exactly* as it is being picked up by the camera lens.

It would also make possible for the first time the use of "slave" monitors in filming shows with multiple cameras, permitting the director to observe the coverage of each camera from a remote position.

Unaware of the complexities of optics or of the continuing rapid advancement of electronics, I nevertheless ventured into the design and production of such a camera. The ensuing four years were filled with many anxious moments. Today, the video-film camera as envisioned is a reality.

Camera Capabilities

This camera is capable of transmitting a "live" image *via* television and at the same time recording the same image on 35-mm motion picture film—both images identical in field because both are picked up by *one and the same lens!*

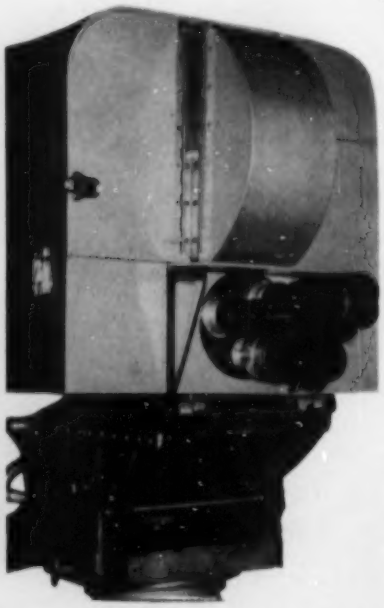
It works this way: an image is picked up by the camera by means of a regular photographic lens which transmits it to the film plane in the usual manner. Between the lens and the film a beam-splitter is interposed which causes a duplicate image to be picked up by the vidicon tube of the electronic side of the camera. The "camera" is actually two-in-one: a film camera and a complete Tv camera.

Uniting the two types of cameras in a single unit made possible the electronic view-finder, with outlets for a number of remote monitors, which cameramen have long hoped for. The electronic finder eliminates entirely the old parallax problem because the image seen on the finder screen is *exactly* that which is recorded on the film and by the Tv pickup tube.

A blimp, 18 x 21 x 21 inches, houses the motion picture camera, electronic components, view-finder and vidicon pickup camera. A cable extends to a master monitor having a 10-inch screen. Additional monitors may be connected at any time. Swinging the various lenses into place is accomplished as easily as with Tv cameras.

Simple Preparatory Steps

Film loading requires only two steps: opening cover of the blimp (to which is attached the electronic finder tube) exposes the film magazines; by depressing a catch, the electronic camera unit swings out of the way, affording access to the film movement, gate, main sprocket and film-retaining rollers.



The functions of a television camera and a film camera are combined in this new video-film camera, which picks up and transmits a television show at the same time it records the show on film—an all-purpose tele-film camera.

When we originally set up the multiple film camera operation, our purpose was to utilize film cameras in the same manner as "live" Tv cameras were being employed at that time—with the camera operators and the grips instructed *via* intercom phone system by the director. A drawback to this system, however, is that the director, usually located in a remote booth on the stage, cannot see *exactly* what each camera is recording.

Errors Immediately Corrected

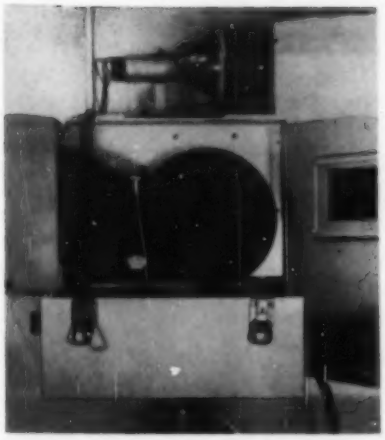
Using our new dual cameras, the director of the show as well as the director of photography can see, on their *remote* monitors, that which each camera is picking up. When errors occur, they can be observed immediately the action takes place instead of having to wait until the "dailies" are printed.

A feature receiving serious consideration is the addition of a cueing device in the camera so that when two or more cameras are used in recording a show the various cameras can be cut in and out, making it possible to edit to some extent the production as it is being shot in the manner that "live" Tv shows are presently "edited."

All-Personnel Constant Check

Still another technical advantage of this dual camera is the ability of the camera operator to keep a constant check on focus. There is no need to rack over and check focus after each take, because the focus quality as seen in the electronic finder corresponds exactly with that of the image reaching the film.

Use of remote monitors with the camera opens up new possibilities for the cameraman as well as the director when dolly or boom shots are being photographed or in the filming of miniatures. Instead of riding the



Looking inside the camera. Here, one unit of sectional door of blimp, which is raised, is shown supporting the electronic finder tube. In lowered position it comes to rest before the aperture on door at right. Film magazine is readily accessible. Door section just below magazine is lowered to give access to camera mechanism for threading.

boom or dolly for critical observation of camera coverage, what the camera records may be seen more conveniently on the remote monitor, which may be located any place near the set.

Even the sponsors of Tv commercials stand to gain when this new camera is employed in shooting advertising spot announcements. The remote monitor will enable them to see the commercial exactly as it will appear on film, *as it is being filmed.* Any changes or corrections that appear necessary may then be made on the spot.

Dual-Purpose Light Level

One of the more important engineering problems encountered was that of insuring that the image recorded by both the film and the electronic camera units would reach each instrument at the required light level. For example, if a given scene is shot with illumination of 200 foot-candles at a stop of *F*:4, the exposure will be the norm for *both* the film camera and the electronic camera without need for any compensating adjustments.

In the course of tests made by Phil Tannura, A.S.C., each of the three lenses on the camera turret were shifted into taking position during the filming of a sequence—each set at the same *F* stop.

"In comparing the results with footage shot earlier that day on the same show with conventional cameras," said Tannura, "the only difference noted was that the dual-camera negative required a printer-light adjustment of two points during printing. On the screen, there was no observable difference in quality. The test footage was shot with the 40-, 50-, and 75-mm lenses."

The advantages of this new, two-purpose camera appear almost endless as one continues to examine its potentials. Used solely as a motion picture camera, it can effect tremendous production economies by speeding up operation on sets, since each take is observable on the monitors by directing personnel.

Tremendous Economies Envisaged

Used in a multiple-camera Tv film show, the economies would be tremendous. It isn't hard to foresee the video-film camera eventually replacing the image orthicon Tv cameras presently in use, because with this camera it will be possible to make first-class film records of a show, replacing kinescopes. Where the camera is employed on Tv "spectaculars," there will be recorded simultaneously a first-quality color motion picture negative from which excellent prints can be made for subsequent telecasting.

With only slight modification, the camera may be employed to transmit a "live" Tv show in full color, at the same time recording the show on color film. Since at present there is no practical way for a color kinescope to be made (and there may not be in the foreseeable future) this camera easily solves the problem of obtaining a simultaneous record of color Tv shows.

When and if practical video tape recording is developed and employed in the production of Tv films, the video-film camera will be a natural for recording such programs for pickup and transmission to the tape recorder, at the same time providing a film record of the program, too.

Motio's Water-Cooled Gate, Aperture Blower

By Fred C. Matthews
Motiograph, Inc.

SEVERAL years ago a number of manufacturers of projectors and arclamps expressed their views in the columns of IP on the merits of the various methods of cooling film in the projector gate. At that time the writer expressed the opinion that the best way to achieve the desired end was to use a combination of a water-cooled film gate and an aperture-cooling blower. Today Motiograph AAA projectors are equipped with both.

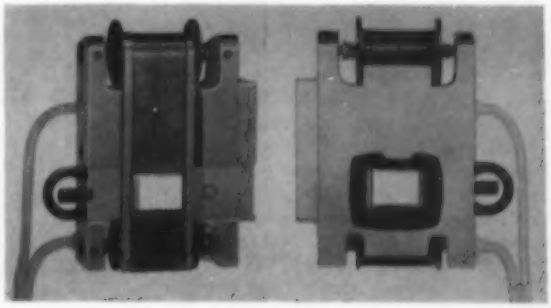
The demand for greater screen illumination has made the problem of heat on film an even greater problem than the one which existed just a few years ago. Arclamp manufacturers are making lamps to operate at higher amperages, and projector manufacturers have increased the size of the openings of their heat shields and decreased the width of their shutter blades; more light pours on the film and, consequently, more heat is also present there.

Water Plus Air-Cooling

The use of water-cooled film gates and aperture-cooling blowers, in my opinion, is still the best answer to cooling film, but it is not the complete answer—some of the heat from the arc must be dissipated before it reaches the aperture.

We recommend first that the arclamp ventilation system be equipped with a fan capable of drawing air at the rate of at least 500 cubic feet per minute. We also urge that the arclamps be equipped with fans to aid in the dissipation of heat.

Our tests of the efficiency of the



THE MOTIOGRAPH WATER-COOLED GATE

Left: film-side view of the gate showing guide rollers top and bottom. Right: rear view of the Motiograph gate.

new Motiograph AAA water-cooled film gate and the AAA aperture-cooling blower were made using lamps equipped with an internal blower. The arclamp ventilating system was equipped with a fan exhausting air at the rate of 500 cubic feet per minute. We feel that without such auxiliary equipment the results of our tests would not have been anywhere near as good as those shown.

No Filter Employed

A series of tests were made on a Motiograph AAA projector equipped with 52-degree shutter blades, the AAA water-cooled gate and the Motiograph aperture cooling blower used in conjunction with a high-intensity reflector-type arclamp with a rotating positive carbon mechanism operating at 135 amperes. *No filter was employed.*

These tests proved conclusively that the film did not buckle even when run for four consecutive 20-minute periods.

Wide Temperature Contrast

An important supplementary result of the tests was the fact that our projectionist, Charles Vonesh, IA Local 110, could immediately rethread without fear of burning his fingers because the gate temperature was only 5 degrees above room temperature. Without water cooling, gate temperature was 190 degrees.

Water-cooled gates and blowers are available as an attachment for Motiograph AA and AAA mechanisms, and may be readily installed by projectionists.

Showing Wide Pictures via. Rear Projection?

To the Editor of IP:

For many years I have found IP of very great assistance; I congratulate you on maintaining a high technical standard.

Do you have any intention of discussing the problems of C'Scope and other wide-screen presentations via. the medium of rear projection? I realize that rear projection using Trans-Lux lenses is not of widespread interest, but those of us who are faced with the new techniques and are handicapped by having rear projection would welcome any information on this topic—something which seems impossible to obtain.

Thank you again for your fine standard of service to the industry throughout the world.

E. POUTNEY
Newsluxe Theatre, Sydney, Australia

EDITOR'S REPLY: The rear projection of wide-screen and CinemaScope films has been unsatisfactory on account of light-distribution and focusing difficulties. The transmission characteristics of translucent rear-projection screens make it exceedingly difficult to obtain adequate illumination on the sides of the screen when films are shown by the wide-screen and CinemaScope techniques.

Practically all American theatres which formerly employed rear projection are reconverting to standard front projection on reflective screens. The conversion involves relocation of the projection room and other costly changes, but is regarded as an inescapable necessity for the presentation of CinemaScope and other wide-screen films.

Idea is Practically Hopeless

Since practically all theatres using rear projection are of an intimate character as to width and length, with a correspondingly small stage opening, IP feels that such structural characteristics alone render it useless to even speculate upon wide-screen processes—unless, and this is the old, old story—one wishes to spend great gobs of money to push the walls out or even to build and equip a new front-throw projection room.

Penthouse Heads Scratch Film

To the Editor of IP:

So far I've not seen or heard anyone touch on one of our biggest headaches since CinemaScope bowed. This theatre has enjoyed full stereophonic sound for the past year now, and I believe we've played about all of the C'Scope pictures. By now I've become convinced that there will be no remedy for our headaches until the present penthouses are redesigned.

Believe it or leave it, this show shop has by this time not yet played a four-track print *without* scratches. I'm not trying to be an alarmist, but since "The Robe" there's been hardly any C'Scope film which was not scratched—and badly. We used these prints (what could we do?) but the four-track pictures simply cannot compete with the other squeezed prints, notably Superscope, the first two of which were clean and without scratches. Superscope, of course, is optical track, thereby not touching the penthouse rollers.

All film going through the penthouse reproducer sure catches hell. Have a good look, fellows, at these C'Scope prints, and I'm sure you'll agree with me.

AL KUIPER
Terrace Theatre, Minneapolis, Minn.

EDITOR'S REPLY: It is true that contact of magnetic-track CinemaScope film with the tension rollers, impedance drums, and magnetic pickup heads of penthouse reproducers greatly increases the number of scratches inflicted on prints during projection. Rollers which contact the entire surface of the film are responsible for most of the damage, especially if they do not pick up speed quickly and if they fail to revolve freely.

Need Film-Guiding Rollers

Scratches and burrs on the film-contacting surfaces of such rollers abrade the film severely. Even gritty particles of dirt adhering to the rollers cause a multitude of fine scratches which have the appearance of "rain" on the screen.

The failure to provide certain film-guiding rollers in a few makes of penthouse soundheads allows film which is threaded to bypass the magnetic reproducer to rub against the edges of the holes in the fire-valve box and the top of the projection mechanism. This has become a serious cause of deep lengthwise scratches in optical-track prints shown in theatres equipped for playing magnetic-track CinemaScope prints. [This source of film damage was discussed by Henry B. Sellwood in the January 1955 issue of IP—"Film Damage on the Increase," page 14.]

Optical Track Upswing

There is a definite trend toward the use of Perspecta sound optical-track reproduction as a satisfactory and comparatively inexpensive substitute for multi-track magnetic reproduction when stereophonic effects are desired. At the present time all producers with the single exception of 20th-Fox are using optical sound exclusively. With the decision to play only optical sound tracks, penthouse soundheads should be removed from the projectors in order to prevent unnecessary film damage.

More of the Same Herein

To the Editor of IP:

I find IP extremely interesting these days, especially since CinemaScope. Your charts on lenses, apertures, ratios, etc., are very useful because one cannot keep all that information in one's head.

PERCY WRIGHT
Secretary, IA Local 467
Port Arthur, Ont., Canada

EDITOR'S REPLY: Thanks, Mr. Wright; but just get a load of the honey of a chart in this issue (in the article by R. A. Mitchell on 'Matching' Apertures and Lenses). More of these charts to come.

What Do You Know About Carbons?

The first of a series of questions and answers which explain the unique nature of carbon and describe how the substance is utilized so as to provide the brightest of all artificial light sources. Data provided by National Carbon Company.

What is Carbon?

Carbon is an element found in abundance in all parts of the world since it it a constituent of all organic materials. The most perfect crystalline form of carbon is the diamond, and even the diamond is excelled in purity by special carbon and graphite electrodes manufactured for use in spectroscopic analysis.

Other well-known forms of essentially pure carbon are graphite, lampblack, charcoal and coke. The latter forms, however, usually contain some mineral or volatile impurities. Coal contains a very high percentage of carbon as well as a variety of tarry hydrocarbons from which the numerous coal-tar products are derived.

What are the Chemical Characteristics of Carbon?

From a chemical standpoint, carbon is very inactive, resisting the effects of most acids, alkalies and solvents. It does not melt at any incandescent temperature, remaining a solid up to about 3670°C. (6640°F.), and then going directly to a vapor without an intervening liquid phase.

It may readily be formed in a variety of shapes, either in the initial plastic condition or later by machining in solid form. In graphite form, carbon is valuable as a lubricant. The thermal conductivity of carbon in non-graphitic form is low as compared with that of most metals; but in graphitic form it is higher than that of most metals.

Although higher in electrical resistance than the metals, carbon is nevertheless a good conductor of electricity, a characteristic adapting it to many uses in the electrical field.

What are some of the Industrial Applications of Carbon?

Various industrial applications of carbon include carbon brushes for motors and generators; welding carbon products; carbon and graphite anodes and electrodes used in electrochemical and electrometallurgical industries; carbon Raschig rings, carbon and graphite tubes and carbon linings, "Karbate" impervious carbon and graphite for heat exchangers and other applications for handling and processing acids and other corrosive materials.

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applications among which are switch and circuit-breaker contacts, resistance discs, steam turbine packing, piston rings, stuffing box packing, thrust rings for automobile clutches, ingot mold plugs and stools, back plates, diaphragms and granular carbon for telephones, electronic tube anodes and grids and, in the form of pure graphite powder, as a lubricant and a constituent of lubricating greases.

What Stresses Must a Projector Carbon be Able to Withstand?

The demands made upon projector carbons are extremely severe and their present high quality has only been attained by painstaking research and years of manufacturing experience. Great care is necessary in selecting raw materials of unusually high purity and in maintaining close control over every step in the six to eight weeks period of production.

Projector carbons must conduct electricity at very high current densities, ranging from 140 to over 1500 amperes per square inch. They must permit the attainment of a very high concentration of energy in the gas ball confined within the positive crater, at the same time supplying material through volatilization of light. No material other than carbon can satisfy these requirements—with the cup-shaped crater surrounding a ball of fire at a temperature in excess of 10,000°F. and with the carbons gripped only a few inches away by metal jaws, the temperature of which cannot safely exceed 2,000°F.

Constant research is necessary to produce new types of projector carbons and means of utilizing them which will meet or anticipate the demands created by the steady development of the motion picture industry.

What was the First Commercial application of Carbon?

The first commercial application of carbon on an extensive scale was in the electric arc lamp. Here the singular characteristics of this element make possible a quality and intensity of illumination which cannot be obtained in any other way. Possessing good electrical conductivity and low thermal conductivity, non-melting and slow burning at the extreme temperature of the arc, remaining a firm solid at a temperature higher than that attainable by any other substance of suitable electrical conductivity, carbon has proved to be the ideal electrode material for this purpose.

Although the carbon arc lamp is no longer used for *general* illumination, its importance has not diminished. The development of new types of carbons for special applications has greatly extended its use into fields where it has shown marked superiority over other sources of illumination. In the home—as well as in hospitals and sanatoria—the carbon arc is used to produce artificial sunlight and radiation of specialized character which physicians practicing light therapy have found valuable in the prevention and cure of certain physical disorders.

Graphic Arts Applications

The carbon arc has become an important tool of industry for processing materials by means of photo-chemical reactions and for accelerated tests of materials which tend to deteriorate under the action of sunlight. The most powerful searchlights utilize highly developed types of carbon arc lamps with carbons designed for this specific purpose. Thousands of carbon arcs are in daily use in photography, photo-engraving, blue-printing, and allied industrial processes.

The motion picture industry would never have reached and could not maintain its present high plane without the aid of the carbon arc which is used both for studio illumination and for projection. The large screen, long throw, and high level of screen illumination in the modern theatre require an intensity in the light source that only the carbon arc can suply. The brightness of the crater may be as much as seven million times the brilliancy of the screen, unequalled by any other source.

That Old Refrain—Just Try To Focus

Here is a common complaint about the poor photographic quality of present theatre release prints—features, shorts, newsreels, whether in black-and-white or color—which makes it practically impossible for projectionists to maintain any acceptable degree of focus. The contributor of these observations is MORRIS KLAPHOLZ, veteran projectionist of IA Local 306, N. Y. City, and official of the 25-30 Club. Comment from the field is invited.

WHY DO film exchanges (or is it the labs?) add about eight frames of leader just prior to the censor's license number at the end of a film? This leader is blank, of course, but why must there be framelines all the way across this section of film? Haven't they ever heard the "motor boat" sound that results?

That isn't all. They insert this strip smack in the middle of the closing music. One has to run all of the license number and then continue with the music again. Is this showmanship?

Recommended Procedure

Here's what I do about it: when I examine the film prior to showing, I cut out this strip entirely and then re-attach the end of the closing music so as to have the proper continuity; *then* I re-attach the license number — but without the strip of blank leader. If the exchange does not like this, I am sorry, but that is the way the film runs in my theatre.

Another gripe. Who is responsible for the horrible focus in present-day films? I'm going blind trying to focus many pictures, and so are my partners. We had a sharper picture 40 years ago — and I mean it!

Improvements for Naught

Today we have faster lenses, better light, better screens, better everything, yet the focus is horrible. Some directors and cameramen are obviously daffy about a "soft" (?) focus. Or are they looking for some other uncanny effect?

The customers complain to the manager, the manager complains to us and we both get short-tempered. This is what happens practically all the time, although I can't say it about my house because our manager is one of those rare fellows who has an appreciation for things technical. Even the newsreels have the worst photography I've witnessed in almost 47 years as a projectionist.

PROJECTIONISTS and movie audiences in areas where no censor seals are required are certainly lucky. License seals having framelines that cross the soundtrack are even worse than the scribblings we sometimes find in the track area of replacement leaders. The only cure is heroic wielding of the scissors.

Another nasty trick is the punching of letters and numbers in titles. If we leave the mutilated film in the reel, the result is a rain of dots on the screen. If we cut them out, the music skips a beat. The proper place for all this claptrap, including censor seals, is at the very end of the leader or runout tail. No one wants or needs whatever dubious information may be conveyed by those wretched inserts and punch-marks.

Release Print at Fault

Naturally, the projectionist is blamed for fuzzy focus by people who don't realize that the screen image can be no clearer than the picture on the film. Wide screens and short-focus lenses deserve part of the blame, but the root of the trouble *definitely lies in the release print.* Mr. Klapholz is 100% correct

when he says that the prints made 40 years ago were clearer and sharper than the average print of today. The silent movies filmed in the 1920's have never been surpassed focus-wise, being sharp from corner to corner. What happens?

The older movies were made by men who were craftsmen above all else. They had a feeling for pictorial quality which is exceedingly rare these days. Negatives, master positives, and dupes were developed by hand and evaluated by visual inspection.

All processing is now handled by machines, and the necessary changes in density from scene to scene are made on the basis of the required development gamma for the soundtrack. Attention is now applied in print control to the densitometric test strips at the beginning and end of each reel. Seldom, and only in the better laboratories, does anyone ever examine the picture itself.

The Speed-Up Technique

There is plenty of sloppy camera work in present-day releases (the speed-up technique). Much of this may be due to the fact that the average cameraman of today is the operator of a motor-driven machine. Set lighting and camera angles have become astonishingly stereotyped, and negative footage is ground out on a mass-production basis.

No one dares to experiment in a commercial movie studio. With the "creative efforts" of the average cameraman limited to pointing the camera at a conventionally lighted set and pressing a button, it is no wonder that the matter of lenses and focus for the best possible pictorial results is often ignored. A few cameramen, most of them old-timers, have enough influence with producers to get away with first-class camera work.

There is no doubt whatever that good negatives are sabotaged in the processing laboratory. Deterioration of the image usually begins with the printing of masters and dupes, especially when optical printing is used. Soiled and improperly focused printer lenses produce blurred images that continue down the line to the final prints. In a few cases we have found dupe negatives made from positives which, in turn, were printed from dupes!

A few of the largest labs are still using obsolete sprocket printers for contact-printing release positives. Not only are these machines obsolete, but they are operated at tremendously high speeds to enable release schedules to be met. Faulty contact of the dupe negative with the positive raw stock blurs the picture, as does also any slippage between the two films. In some cases these antique printers are adjusted for shrunken nitrate negatives, not for the unshrunken safety-film dupes which are being used. It all adds up to the old, old story of wornout and inadequate equipment.

Bausch & Lomb

f/1.8

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Oops! Says IP on Lens-Cleaning Data

On page 24 of IP for last month (April) there appeared a bold-face box under the heading "Lens-Cleaning Rules" which is incorrect in one very important particular. IP's technological felony was compounded by a supplementary line stating "Post These Rules for Ready Reference." If our IP stalwarts have posted this box, get rid of it — quickly! Appended is a communication from Mr. Joseph A. Featherston, Kollmorgen Optical Co., who, apart from being horror-stricken at Rule 2 in the aforementioned presentation, provides additional useful data relative to modern lenses:

Mindful of IP's unswerving devotion to the very best in technological procedure, we offer the following commentary relative to the item headed "Lens-Cleaning Procedure" on page 24 of your last (April) issue.

NEVER *under any circumstances* should water or soap or any detergent be used to clean a projection lens!

Kollmorgen instructions for the cleaning of lenses have been practiced since 1948, and we have had no negative comments. We get lenses in for reconditioning which evidence that powders have been used in the cleaning process, with the result that the lens coating, especially on the outside of the rear element, has practically been removed.

We feel that solvents are more advantageous as a cleaning agent than water, soap and water, or detergents and water, because they dissolve oily residue more readily. Also, solvents evaporate, while water must be dried off. We specify lens tissue because it was found impossible to accurately describe just what constituted "clean cotton cloth" or "well-washed" linen. These terms are very misleading and induce much trouble.

General Terms Misleading

Another problem in recommending soap as a cleaning agent was to specify *exactly* what is meant by a *"weak soap solution."* In *"hard water"* areas considerably more soap would have to be used than in *"soft water"* areas. The soap must be removed with distilled water, or layers will form and become baked by the heat of the arclamp. The only possible way to remove such a deposit would be by volatile solvents.

In repairs, we have found that the rear gasket seldom shows any disintegration, regardless of what method of cleaning was employed.

No matter what the method of cleaning, the lens coating, especially on the rear element, will eventually wear off. Kollmorgen has a standard reconditioning job that consists of repolishing and recoating this element, cleaning, adjustment and resealing. Such a job, if it is done every two or three years, will, we believe, maintain the lenses in excellent condition.

Theatre Tv Gaining Slowly

Continuing expansion of the theatre Tv field is indicated by contracts from 85 theatres throughout the country which showed the Marciano-Cockell heavyweight championship fight in San Francisco on May 16.

Theatre Tv is still handicapped, however, by the limited number of saleable attractions available for programming. General Precision Labs, manufacturer of theatre Tv projection equipment, announced that sales of this equipment during 1954, while not large, had been the best of any year so far, and also noted that box-office receipts for such programs during 1954 had improved. GPL, however, does not expect any substantial increase in equipment sales until more theatre Tv entertainment is available.

PERSONAL NOTES

PHILIP GRUEN, veteran field engineer attached to Altec Service Corp.'s northeastern division in the New England area, died suddenly on April 21. Gruen entered the service field in 1929 under

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the ERPI banner, joining Altec in 1937. He leaves a widow, Mrs. Frances Gruen, and a daughter.

BERNARD SHOLTZ, for the past 25 years with RCA in the Eastern equipment field, has been named vice-president in charge of sales for NORPAT SALES, INC., 113 West 42nd St., N. Y. City. Prior to his RCA post, "Barney," as he is known far and wide in equipment circles, spent many years as a film salesman, thus he has cemented a host of exhibitor friendships. Norpat carries a full line of theatre equipment.

E. ARTHUR HUNGERFORD, JR., formerly manager of the Tv department of General Precision Labs., has been named executive director of the Metropolitan N. Y. Educational Tv Assoc., responsible for the development activities in building an educational Tv station.

FENNER G. HEADLEY, until now motion picture finishing supervisor for the Du Pont Co.'s photo products plant at Parlin, N. J., has been named motion picture sales supervisor for the New York district. He succeeds NORMAN F. OAKLEY, a veteran of nearly 40 years service with the company, who becomes special advisor on motion pictures sales in the district. Oakley has long been a close associate of cameramen, projectionists and other members of the organized crafts.

OBITUARY

HORACE B. JOHNS, 60, business representative of Philadelphia Local 307 for the past 25 years, died April 20 last. He was formerly chief projectionist at the Boyd Theatre. A member since 1913, Mr. Johns served on the executive board and represented Local 307 at every IA Convention since 1930. He was a member of the Masonic Order. Survivors are his wife, a son, three sisters and two grandchildren.

GEORGE THIBODEAU, member of Local 195, Manchester, N. H., succumbed last month to a long illness. He worked as projectionist for many years in and around Manchester.

EDWARD F. LAVERY, 64, member of IA Local 277, Bridgeport, Conn., succumbed to a heart attack on March 25 last. A member of the Local since 1916, he worked as a projectionist at Loew's Poli Theatre for the past 28 years. Born in Bridgeport, Edward Lavery was a life-long resident there. He was a staunch unionist, always ready to serve his Local for the best interests of the membership. Down through the years he served Local 277 in various official capacities, and was called upon to represent the Union at numerous wage negotiations and controversies. Edward Lavery enjoyed the respect and affection of his brother members, who will always remember him for his unselfish devotion to the welfare of others.

EDWARD J. DOWLING, 55, member of Local 350, Meriden, Conn., died last month after a brief illness. For the past 20 years he worked as projectionist at various theatres in Meriden. Prior to his work as a projectionist, Dowling was a member of the famous Lew Dockstader Minstrels troupe.

ARTHUR POTTER, 70, projectionist at the Six Mile-Uptown Theatre in Highland Park, Mich. died on March 25 last. He was a member of many years standing in Detroit Local 199.

THOMAS IVANS, 65, member of Local 228, Toledo, Ohio, died last month after a short illness. He was a member of the Toledo Local since 1913, and prior to his retirement five years ago, worked as projectionist at the Esquire theatre in Toledo.

N. C. 'Yellow Light' Carbons

National Carbon Co. is now producing carbons for motion picture studio set lighting to provide spectral energy distribution of around 3300° K. which will match the spectral sensitivity of present color films. The new color carbons will require only a very light filter to absorb a slight excess of near ultraviolet. With the addition of this filter over the lamp, carbon arc lamps may be freely mixed with incandescent tungsten on motion picture sets.

This drastic change in color temperature has been obtained without loss of measurable light, which means that the photographically effective illumination from an arclamp will be almost doubled without additional power input. The carbons have passed rigorous tests for both set lighting and process (rear) projection.

The balanced white light of the standard high-intensity carbon arc will still be used for "booster" light on outdoor sets where a sunlight balance is desired.

Canadian Theatre Scene

Canada now has 112 closed film theatres of various types, of which 67 were shuttered during the past year. Obsolescence in both equipment and appointments, no less than other factors such as poor location and changing trading areas, are named as major factors in the closings. On the credit side, there have been opened recently 27 modern indoor theatres and 4 large drive-ins.

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IN THE SPOTLIGHT

(Continued from page 21)

served on the executive board of Local 233 for 30 years.

Before setting out for foreign lands, the Franklins plan to spend some time visiting their two children—Cecil, Jr., who is on the faculty of the University of Southern Illinois, and their daughter, Jean, who makes her home in Florida.

● We don't have many poet laureates in the projectionist craft—or in any other craft for that matter—but Milford Shields, projectionist at the Kiva Theatre in Durango, Colo., is one of the very few. Last June he was named poet laureate of Colorado, and his latest work, soon to be presented to the State Historical Museum in Denver, is called "Design for a Curtain of Light" and contains poems dedicated to the free nations of the world.

Shields is presently at work on another project—that of designing and advocating a special flag for all the school children of the world. Such a flag, he contends, might be used in case of war to identify all school buildings. In addition to all these enterprises, he is a 32nd degree Mason and

Milford E. Shields

holds a number of offices in the Order. A pretty busy man—in anybody's book.

● Before an assemblage of more than 850 persons, including notables in all branches of the motion picture, radio, and Tv industries, IA President Richard F. Walsh was the honor guest of and received from the Variety Club of New York the Heart Award for conspicuous unceasing effort in behalf of charitable and other community projects.

While Walsh was the honor guest at the affair held in the Grand Ballroom of the Waldorf Astoria Hotel in New York City, he stated flatly in his opening remarks that he regarded himself as merely an instrument in rallying support for charitable enterprises by organized labor, and that the rank-and-file of all participating unions deserved the major share of credit.

"Obviously," continued Walsh, "no individual could accomplish much without the unselfish cooperation of all the members of his organization." This was a reference to the statement by William German, distributor of Eastman film and last year's Award winner, that Walsh will be "the custodian of this Award for the men and women of the more than 900 Local Unions of the IA."

Walsh, who has served as a direc-

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tor of the Variety Club Foundation to Combat Epilepsy since its inception, predicted that this and other dread diseases now lacking a specific cure would be conquered by the same means employed to develop the polio vaccine. He pleaded for continuing support by employers in providing work opportunities for those afflicted with epilepsy and other insidious ailments. Walsh's obviously sincere address moved the large audience at the dinner, and all who heard him agreed that he reflected much credit upon organized labor in general and his own IA organization in particular.

Many IA Locals were represented at the dinner by special tables for their units, and in addition there was a host of individual IA members present, mention of who herein is prevented by space limitations.

● The California State Fair and Exposition and the Sierra Camera Club of Sacramento will hold a joint North American International Exhibit from September 1st through the 15th. Closing date for entries of prints is July 29, and for slides, August 11. Entry blanks may be obtained by writing to the California State Fair and Exposition, P. O. Box 2036, Sacramento, Calif.

In an unanimous opinion by the presiding justice, the Appellate Court reversed the Superior Court ruling and directed confirmation of the arbitration award. The upper Court upheld Local 150's contention that "the arbitrators acted within their powers in undertaking to make a determination as to the scope of the contract" and that the award in favor of the union "would leave it free to insist upon a new or supplemental agreement settling the 3-D picture dispute." The Appellate Court declared that "the demand of the theatre was denied because it was determined that the *contract did not cover 3-D projection.*" That's that.

BULB RECTIFIER ANATOMY

(Continued from page 17)

by burning the filament at a reduced voltage), have mistakenly assumed that the longevity of Tungar-type bulbs is increased by reducing the filament voltage. This has sometimes been done as a means of reducing arc-amperage, as, for example, when a projectionist wishes to decrease his arc-current from 75 to 60 amperes.

Destructive positive-ion bombardment of the filament occurs to some extent whenever filament-temperature is reduced below its normal value *and the impedance of the plate circuit is not correspondingly increased!* Hence, reducing filament-voltage as a method of reducing arc-amperage almost invariably damages rectifier bulbs, shortening their life by decreasing electron-emission and current-output.

Varying Output Current

In some cases the output becomes erratic when filament-voltage is reduced; in all cases the development of differences in the outputs of the 2, 4, 6, or 8 bulbs of the rectifying unit causes flicker in the screen illumination.

The method used for varying output current differs in the various makes of tube rectifiers. The best method employs taps on the power secondary winding of the transformer. (Primary taps are intended only for the correction of high or low line-voltage conditions, not for regulating arc-current.) Taps on the power secondary permit the selection of a desired arc amperage without radically affecting the filament-voltage. The filament secondary has no taps.

Filament Voltage vs. Arc Current

If no current-regulating taps or control-knob are provided on the power secondary, and it is desired to decrease arc current, the best and safest method is to insert a suitable ballast rheostat in series with the arc. To repeat, *never reduce filament-voltage to regulate arc current!*

No harm is done to Tungar-type rectifying bulbs by leaving the filaments lighted at times when no load is applied to the plates. As a matter of fact, con-

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tinuous heating of the filaments by the recommended full filament voltage is excellent insurance against destructive back-current effects produced by transformer reactance.

Operating Procedure Elective

If the rectifying units are properly designed and operated, however, it does not matter whether the rectifiers are periodically turned on and off, or left on throughout the whole show. When left on without plate load, no current is consumed except the small amount needed to light the bulb filaments. The transformer will not get hot during the no-load intervals.

Most projectionists prefer to leave both rectifiers on during the show; but others prefer turning each rectifier on only when its output is needed. It matters little which procedure is followed.

By ARTHUR J. HATCH
The Strong Electric Corporation

BEFORE we could give a firm answer to this question we should have to know whether the rectifier tubes are of the argon (Tungar) type or the Mercury type. The reason for this will be evident as follows:

The Mercury type tubes require a preheating time of approximately 3 to 5 minutes before the arc is struck. The practice followed in rectifiers of our design is to make provision so that the filaments of the rectifier tubes are energized as soon as the projectionist enters the room to begin operation for the day, and the filaments are kept on throughout the length of the show.

Continuous vs. Intermittent Duty

Transformers for heating these filaments are usually separate from the plate transformer of the rectifier and are designed for continuous duty operation. This eliminates the need for the projectionist to remember to turn the filaments on 3 to 5 minutes ahead of the time he wishes to strike the arc, and the rectifier is in standby condition at all times.

On the other hand, in the design of Tungar-type rectifiers (with the possible exception of a few that were made a couple years ago for 3-D presentations) these types are designed for intermittent duty, and as the filament requires only 2 or 3 seconds preheating time before the arc can be struck, it is not necessary to provide a separate filament transformer, and filament windings are wound on the same transformer as the plate winding.

These rectifiers are designed for 20-minute intermittent service cycles, and if filaments thereon are left lighted during the entire length of the show,

FIGURE 2
In addition to the electrons emitted by the heated filament, a rectifier bulb contains atoms of argon gas. These, when bombarded by electrons, give out additional electrons which increase the flow of current. The diagram shows how a single electron emitted from the filament results in several electrons received by the plate.

the rectifier will become overheated because it will be exceeding the design specifications even though the arc is being burned intermittently.

Current Surge Harmful

Furthermore, if the filaments are left lighted in this type rectifier, and since there is no provision to separate the plate supply from the filament supply, it means that the D. C. terminals of the rectifier are energized constantly. Therefore, to both strike the arc and extinguish the arc it is necessary to connect the lamphouse table switch in the D. C. supply leads. When a switch is located in these D. C. leads and operated to extinguish the arc, it puts a surge on the D. C. Tungar tubes and is apt to cause flashover and destruction of the tubes.

It is our impression that the turning of the filament off and on does not effect the bulb life by causing sagging of the filament, and we believe that we are on safe ground when we state that the life of the bulb is in reality measured by the length of time that it is actually rectifying. Of course, this does not mean to say that the filament might not burn out if the filament were turned on and left on several years without the bulb actually rectifying. However, in average use we would not believe it would make any particular difference in the life of the bulb whether the filaments were turned off or left on continuously. I would suggest you contact some tube manufacturer in regard to this last point.

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'MATCHING' APERTURES AND LENSES

(Continued from page 11)

phic section of the table for a relative picture height as close in value as possible to the CinemaScope relative picture height previously found. This will tell you which aperture and lens you must have to match wide-screen picture height to your CinemaScope picture height.

Quite likely you will find two, three, or even four non-anamorphic heights which match very closely your CinemaScope height. That being the case, you have a choice of apertures and lenses! Choose the combination which will give the most pleasing wide-screen picture in your theatre.

A specific example may help to clarify the procedure. Suppose you are showing optical-track CinemaScope (0.839" X 0.715" aperture) with a 4½-inch lens behind the anamorphic image-expanding attachment. Which aperture and lens should be used for non-anamorphic wide-screen projection?

The table shows that 0.1589 is the CinemaScope *relative* picture height. Searching through the non-anamorphic section of the table, we find that we may use any of the following apertures and lenses to give a wide-screen picture height which is practically the same as the CinemaScope picture height:

0.825" X 0.412" ratio 2/1 lens E.F. 2.50"
0.825" X 0.446" ratio 1.85/1 lens E.F. 2.75"
0.825" X 0.471" ratio 1.75/1 lens E.F. 3.00"
0.825" X 0.497" ratio 1.66/1 lens E.F. 3.25"

In addition to these four wide-screen aspect ratios we may also use the standard aperture (0.825" X 0.600") with a 4-inch lens. Now which of these five ratios will you select. We suggest the 1.75/1 aspect ratio as best for non-anamorphic wide-screen. If the management be willing, standard picture format should also be used from time to time. In any case, movable velour-covered side battens are recommended for concealing blank areas of the screen when films other than CinemaScope are being shown.

2. TO MATCH CINEMASCOPE HEIGHT WITH WIDE-SCREEN HEIGHT.

In this type of picture-matching problem, locate wide-screen relative height in the table, and then find one or more CinemaScope heights in the anamorphic section of the table to match. (A difference in height amounting to only an inch or two is not important and is easily concealed by the screen masking.)

3. TO MATCH WIDE-SCREEN WIDTH WITH CINEMASCOPE WIDTH.

Use the same procedure employed for matching heights, but keep in mind the recommendation that non-anamorphic wide-screen aspect ratio not exceed 2/1. You will therefore have to use the 2/1 CinemaScope aspect ratio (aperture 0.715" X 0.715").

4. TO MATCH BOTH HEIGHT AND WIDTH OF CINEMASCOPE AND WIDE-SCREEN.

Because widths as well as heights must be matched, use the 2/1 CinemaScope aspect ratio. Instead of searching through the body of the table, merely find the 2/1 non-anamorphic ratio (aperture dimensions 0.825" X 0.412") in the left-hand column. The choice is thus considerably restricted, it being necessary only to find the width and height numbers which match very closely the 2/1 ratio CinemaScope width and height numbers.

EXAMPLE: I am using a 5¼-inch lens with the 0.715" X 0.715" Cinema-

Record Columbia 1954 Profit

Columbia pictures realized a net profit after taxes for the six-month period ended Dec. 25 last of $2,853,000, highest in the company's history. In the same period of 1953 profits totaled $1,910,000.

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Scope aperture. To match this shape and size of picture in non-anamorphic wide-screen, I must use the 0.825" X 0.412" aperture with a 3-inch lens. The match is practically perfect, as both pictures have a 2/1 aspect ratio and the same width and height to within a small fraction of an inch at even the longest projection distances encountered in theatres.

5. TO MATCH THE HEIGHT OF "CONVENTIONAL" AND NON-ANAMORPHIC WIDE-SCREEN PICTURES.

"Conventional" pictures are those shown with the standard 0.825" X 0.600" aperture. Suppose that we elect to keep on using this aperture (aspect ratio 1.375/1) on most pictures for increased brilliance and clarity, employing non-anamorphic wide-screen only for non-CinemaScope pictures of a "spectacular" nature. And suppose, also, that we wish our wide-screen to have the 1.85/1 aspect ratio.

If the lens used for standard projection is 4 inches in equivalent focus (E.F.), what lens must be used with 1.85/1 ratio aperture (0.825" X 0.446") to give a picture having the same height as the conventional picture?

The table shows our relative picture height in standard projection to be 0.1500. The height nearest this value in the 1.85/1 line is 0.1487. This is produced with a 3-inch lens. So, then, we shall use a 4-inch lens with the normal 0.825" X 0.600" aperture, and a 3-inch lens with the wide-screen 0.825" X 0.446" aperture.

6. TO MATCH THE WIDTHS OF CONVENTIONAL AND WIDE-SCREEN PICTURES.

Stop right here and think! Is any table needed to solve this type of problem? No, it is only necessary to use the same lens with the different non-anamorphic apertures. We do not recommend doing this, for it amounts to nothing more than cropping height from the standard picture without magnifying the resulting wide-screen picture. The effect is terrible!

7. TO MATCH THE HEIGHTS OF CINEMASCOPE, ANAMORPHIC VISTAVISION AND SEVERAL RATIOS OF WIDE-SCREEN PICTURES.

By using the accompanying table, you can easily match the heights of as many different anamorphic and non-anamorphic aspect ratios as you please! Simply decide on one type of aperture and E.F. of lens you intend to use, finding the resulting relative picture height in the table, and then comb through the body of the table to find similar picture heights in the various aspect ratios you desire.

This picture-matching table is designed to aid projectionists and service engineers by instantly revealing all picture-matching possibilities and eliminating tedious arithmetic.

The battle of the aspect ratios shows no signs of abating; in fact, it is getting worse. If two different kinds of anamorphic processes were not enough, Paramount has complicated matters with its double-frame system of projection. Double-frame projection of a horizontally running film, however, does not interest the average theatre owner. The equipment is expensive and troublesome, and does not fit into the average projection room.

Presentation Flexibility Desirable

CinemaScope is the anamorphic system *par excellence*; and even though the Vista Vision method of photographing and printing standard release prints is an important development in the direction of image-definition, anamorphic VistaVision seems unlikely to supplant CinemaScope or even to co-exist with it.

Only those exhibitors who possess adjustable prism-type anamorphic attachments can show anamorphic VistaVision prints without incurring extra expense. The expansion-factor of any lens-type anamorphic attachment is fixed; but many technologists are convinced that lens-type anamorphots are superior to all other types for image-clarity and high light transmission.

The CinemaScope process has been remarkably improved since its introduction. CinemaScope improvements are to anamorphic projection what VistaVision photography and new Technicolor improvements are to non-anamorphic projection. As CinemaScope exists today, it is certainly the equal of any other single-strip method of presenting panoramic movies, not excepting from consideration the various wide-film processes. On the other hand, it is most unlikely that CinemaScope will ever entirely replace standard non-anamorphic films.

The two processes, standard and CinemaScope, may well continue to co-exist in amicable relationship. The motion picture theatre needs them both—standard films for the more intimate and emotional type of drama, and CinemaScope film for the visually grander, but less penetrating, productions.

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City ..... *Zone* ..... *State* .....

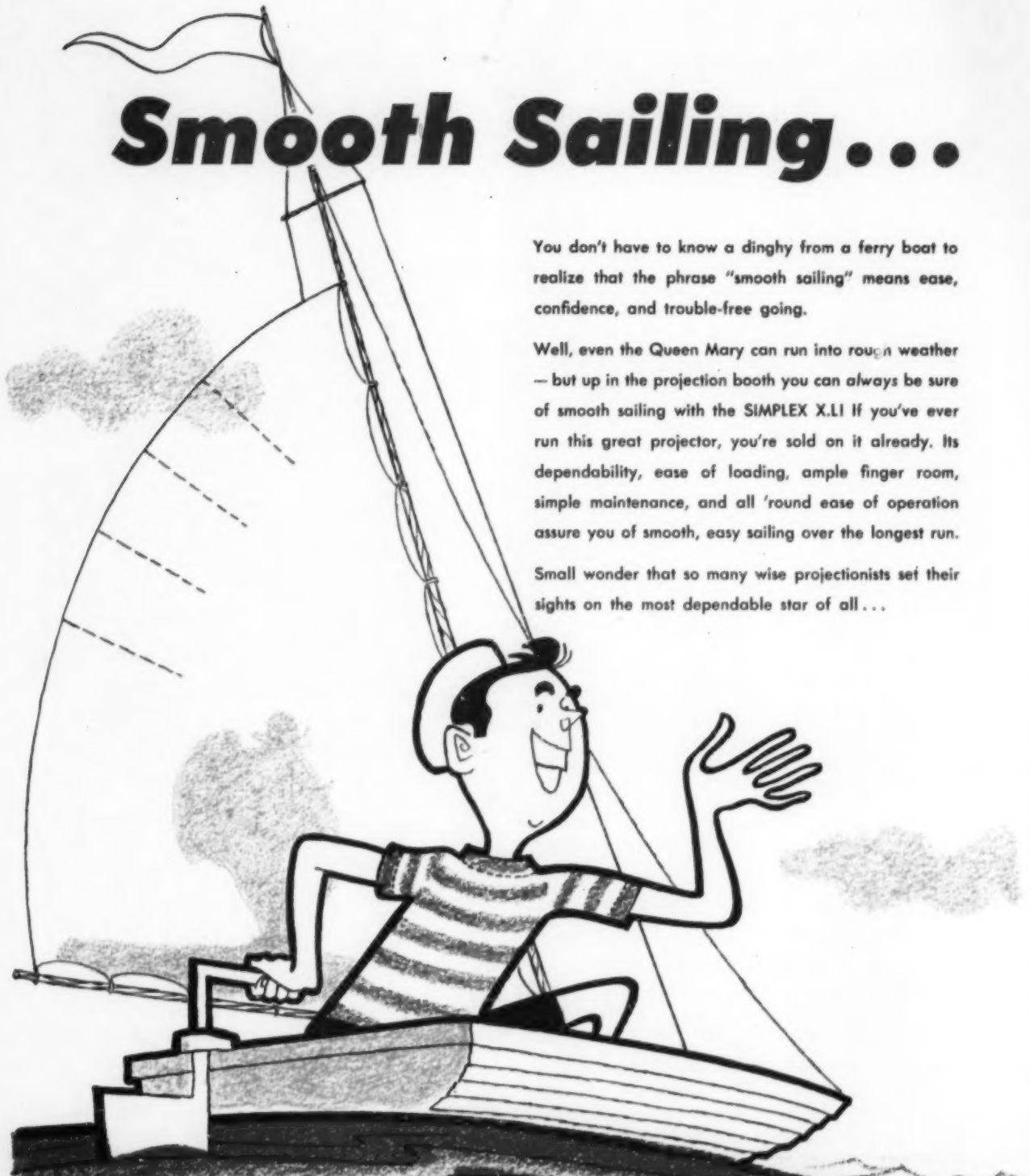
But why MEN over 45?

Our doctors still don't know *why*, but if you are a man over 45 you are six times as likely to develop lung cancer as a man of your age twenty years ago. They *do* know, however, that their chances of saving your life could be about *ten times* greater if they could only detect cancer long before you notice any symptom in yourself. (Only 1 in every 20 lung cancers is being cured today, largely because most cases progress too far before detected.) That's why we urge that you make a habit of having your chest X-rayed every six months, no matter how well you may *feel*. The alarming increase of lung cancer in men over 45 more than justifies such precautions. Far too many men die needlessly!

Our new film "The Warning Shadow" will tell you what every man should know about lung cancer. To see this film and to get life-saving facts about other forms of cancer, phone the American Cancer Society office nearest you or simply write to "Cancer"—in care of your local Post Office.

American Cancer Society

Smooth Sailing...



You don't have to know a dinghy from a ferry boat to realize that the phrase "smooth sailing" means ease, confidence, and trouble-free going.

Well, even the Queen Mary can run into rough weather — but up in the projection booth you can *always* be sure of smooth sailing with the SIMPLEX X.L! If you've ever run this great projector, you're sold on it already. Its dependability, ease of loading, ample finger room, simple maintenance, and all 'round ease of operation assure you of smooth, easy sailing over the longest run.

Small wonder that so many wise projectionists set their sights on the most dependable star of all...

Simplex PROJECTION and SOUND SYSTEMS

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